MITSUBISHI ELECTRIC

Changes for the Better

AIR CONDITIONING SYSTEMS

CITY MULTI

DATA BOOK

MODEL

CONTROLLER

Preface

DATA BOOK describes the technical specifications of MITSUBISHI ELECTRIC Corp.'s CITY MULTI air conditioning system products.

DATA BOOK CONTROLLER MEES21K058 is updated from DATA BOOK CONTROLLER MEES19K060.
The contents below are added as well as some minor revisions.

PZ-60DR-E has been changed to PZ-61DR-E.
MCC-50A has been added to the lineup.
PAR-SR3LA-E has been changed to PAR-SR4LU-E.

We recommend DATA BOOK users to read carefully and take advantage of all the contents inside to design the CITY MULTI air conditioning system and/or to prepare documents for promotions.

Along with the DATA BOOK, MITSUBISHI ELECTRIC provides a Design-Tool software to ensure the users to design the system correctly and simplify the calculations. Please contact your local distributor for this software.

Please be notified that specifications are subject to change without notice due to continual improvements of the product.
For any inquiries, please contact your local distributor.

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In this manual, Windows® 10 will be referred to as Windows 10, Windows® 8.1 Pro as Windows 8.1, Windows® 7 Professional as Windows 7, Windows Vista® Business as Windows Vista, Windows® XP Professional as Windows XP, and Windows® 2000 Professional as Windows 2000.

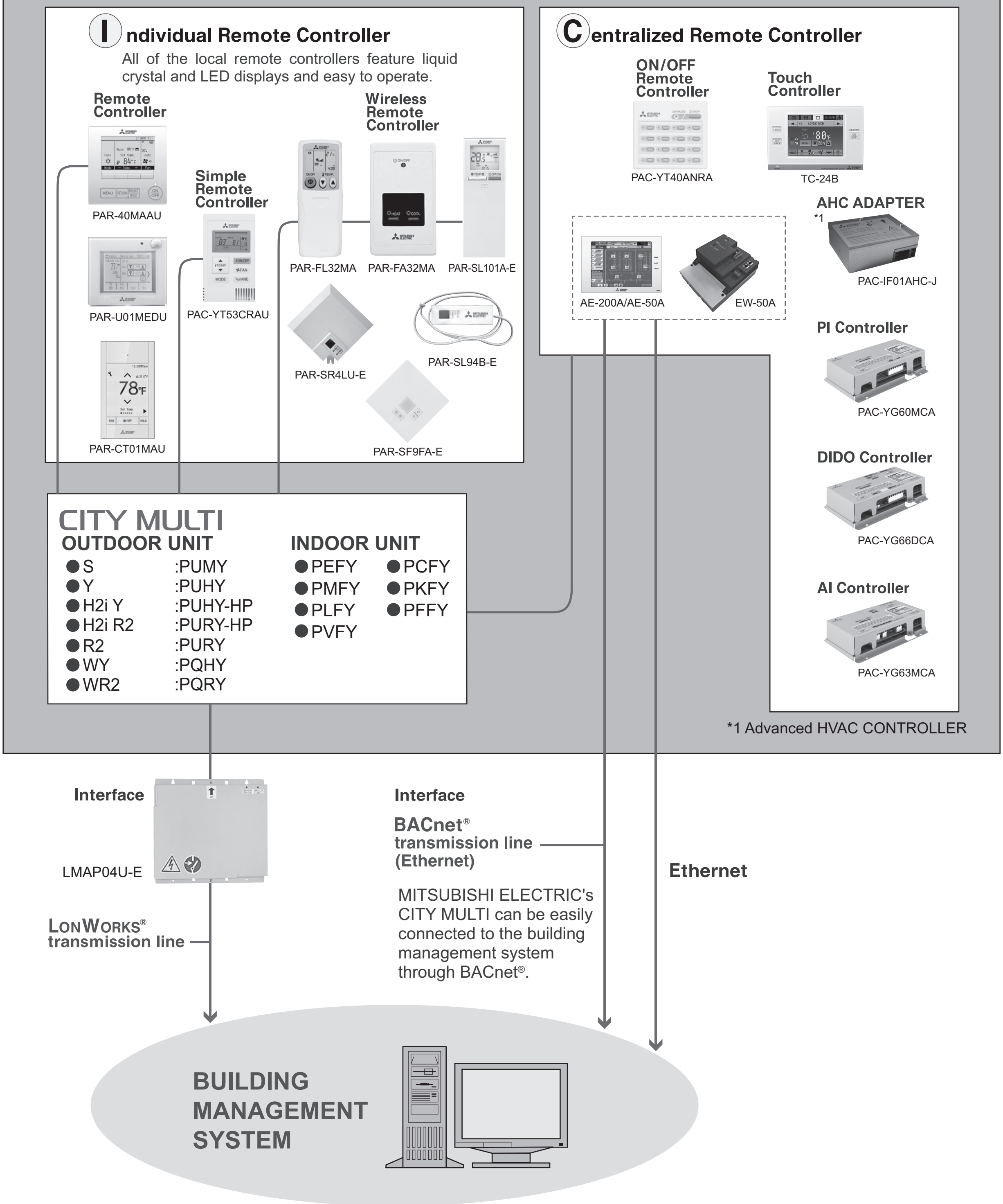
Controller

System Controller

MITSUBISHI ELECTRIC's Air-conditioner Network System (MELANS) leads air conditioner management a PC browser and Network era.

▶MELANS

Use of our MELANS products enhances EFFICIENCY and QUALITY of air-conditioning, contributing to ENERGY SAVING and reduction in running cost. We offer a wide variety of MELANS products to meet all requirements - from the smallest and simplest to the largest and most complex.
We have individual remote controllers, various centralized controllers, and centralized integrated software, as well as BMS interface hardware and software etc. Above all, with AE-200A/AE-50A/EW-50A, PC browser and long distance remote control (monitoring and operating) via communication Network is possible and easy.



*Some controllers cannot be used in combination with certain models of devices.

1-1. Function table of controllers

Model	Local remote controller *7						System controller *7							
	PAR-CT01MAU	PAR-40MAAU	PAR-U01MEDU	PAC-YT53CRAU	PAR-FL32MA	PAR-SL101A-E	PAC-YT40ANRA	TC-24B	AE-200A /AE-50A		AE-200A + AE-50A/EW-50A		EW-50A	
Controllable Groups/Indoors (Group/Indoor) *6	1/16	1/16	1/16	1/16	1/16	1/1	16/50	24/24	50/50		200/200		50/50	
									AE-200A	Browser	AE-200A	Browser	EW-50A	Browser
■Operation														
ON/OFF	○	○	○	○	○	○	◎	◎	◎ ■	◎ ■	◎ ■	◎ ■	▲	◎ ■
Mode (cool/heat/dry/fan/auto)	○	○	○	○	○	○	N	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Mode (Setback) *9	○	○	○	○	N	○	N	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Temperature setting	○	○	○	○	○	○	N	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Dual set point *9	○	○	○	○	N	○ *12	○ *11	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Local Permit/Prohibit	N	N	N	N	N	N	N	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Fan speed	○	○	○	○	○	○	N	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Air flow direction	○	○	○	○	○	○	N	◎	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
■Status monitoring														
ON/OFF	○	○	○	○	○	○	◎	◎	◎	○	◎	○	▲	○
Mode (cool/heat/dry/fan)	○	○	○	○	○	○	N	○	○	○	○	○	N	○
Temperature setting	○	○	○	○	○	○	N	○	○	○	○	○	N	○
Local Permit/Prohibit	○	○	○	○	N	N	○	○	○	○	○	○	N	○
Fan speed	○	○	○	○	○	○	N	○	○	○	○	○	N	○
Air flow direction	○	○	○	○	○	○	N	○	○	○	○	○	N	○
Indoor temperature	○	○	○	○	N	N	N	○	○	○	○	○	N	○
Filter sign	○	○	○	N	N	N	N	○	○	○	○	○	N	○
Error flashing	○	○	○	○	N	N	○	◎	○	○	○	○	▲	○
Error code	○	○	○	○	N	N	○	○	○	○	○	○	N	○
Operation hour	N	N	N	N	N	N	N	N	N	N	N	N	N	N
■Scheduling														
One day	○	○	○	N	N	N	N	○	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
ON/OFF times per day	1	1	1	N	1	1	N	16	24	24	24	24	N	24
Weekly	○	○	○	N	N	N	N	○	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
ON/OFF times per week	8 x 7	8 x 7	8 x 7	N	N	N	N	16 x 7	24 x 7	24 x 7	24 x 7	24 x 7	N	24 x 7
Annual	N	N	N	N	N	N	N	N	◎ ■	◎ ■	◎ ■	◎ ■	N	◎ ■
Optimized start-up	N	N	N	N	N	N	N	N	○	○	○	○	N	○
Auto-OFF timer	○	○	○	N	N	N	N	N	N	N	N	N	N	N
Min. timer setting unit (minute)	5	5	5	N	10	10	N	5	1	1	1	1	N	1
■Recording														
Error log	○	○	○	N	N	N	N	○	○	○	○	○	N	○
Daily/monthly report	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Electricity charge	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Energy management data	N	N	N	N	N	N	N	N	N	●	N	●	N	●
■Other														
Temp-set limitation by Local R/C	○	○	○	○	N	N	N	N	N	N	N	N	N	N
Temp-set limitation by System controller *8	○ *4	○ *4	○	○ *4	N	N	N	○	N	○ *2 *4	N	○ *2 *4	N	○ *2 *4
Operation lock	○	○	○	○	N	N	N	◎	N	N	N	N	N	N
Night setback	N	N	N	N	N	N	N	N	○	○ *2	○	○ *2	N	○ *2
Sliding temperature control	N	N	N	N	N	N	N	N	○	○ *2	○	○ *2	N	○ *2
■Management (Group/Interlocked)														
Ventilation interlock	N / ○	N / ○	N / ○	N / ○	N	N	○	○	○	○ / ○ *2	○	○ / ○ *2	N	○ / ○ *2
Group setting	○ *1	○ *1	○	○ *1	N	N	○	○	○	○ *2	○	○ *2	N	○ *2
Block setting	N	N	N	N	N	N	N	N	○	○ *2	○	○ *2	N	○ *2
Review of electricity charge	N	N	N	N	N	N	N	N	N	N	N	N	N	N
■Operating on Lossnay interlocked (Group/Interlocked)														
ON/OFF	N / ○	N / ○	N / ○	N / ○	N / ○ *5	N / ○ *5	◎ / ◎ *3	◎ / ◎	◎ / ◎	◎ / ◎	◎ / ◎	◎ / ◎	▲ / ▲	◎ / ◎
Fan speed	N / ○	N / ○	N / ○	N	N	N	N	◎ / ◎	◎ / ◎	◎ / ◎	◎ / ◎	◎ / ◎	N / N	◎ / ◎
Ventilation mode	N / N	N / N	N	N	N	N	N	◎ / N	◎ / N	◎ / N	◎ / N	◎ / N	N / N	◎ / N
■Status monitoring on Lossnay interlocked (Group/Interlocked)														
ON/OFF	N / ○	N / ○	N / ○	N / ○	N	N	N	○ / ○	◎ / ◎	◎ / ◎	◎ / ◎	◎ / ◎	▲ / ▲	◎ / ◎
Fan speed	N / ○	N / ○	N / ○	N	N	N	N	○ / ○	○ / ○	○ / ○	○ / ○	○ / ○	N / N	○ / ○
Ventilation mode	N	N	N	N	N	N	N	○ / N	○ / N	○ / N	○ / N	○ / N	N / N	○ / N

◎: Each group/Batched　○: Each group　●: AE-200A/AE-50A/EW-50A license registration possible.　N : Not Available (Not Used.)

▲: Batched handling (for maintenance)　■: Block

*1. Group setting via wiring between Indoor units with cross-over cable;
*2. Installation possible at Initial setting web browser;
*3. Interlock is set at Local remote controller.
*4. This function can only be set on the ME remote controller.
This function cannot be used with the MA/Simple MA remote controller.
(However, the validity of this function with the MA/Simple MA remote controller depends on the indoor unit model, and it is possible to use this function with them.)
*5. Interlock is set from system controllers (Except PAC-YT40ANRA) or local remote controllers.
*6. The maximum number of controllable units decreases depending on the indoor unit model.
*7. For indoor use only.
*8. No license is required for the TC-24B.
*9. This function is supported only when all of the indoor units, remote controllers, and system controllers that are connected to a given group features said function.
*10. Supports the dual set point function
*11. Please contact your local distributor regarding the availability of this function.
*12. Function setting of this remote controller is necessary.

Air conditioner control system interface

LMAP04U-E: LonWorks® Interface
Controls up to 50 Groups/50 units,
for details, refer to its description *10

CONTROLLER

2-1. MA Touch Remote Controller [PAR-CT01MAU-SB]

Dual Set Point

- Backlit LCD
- Color LCD
- Can be set and shown by 1°F/0.5°C.

■ Functions

1. Operation/Display

○: Available ×: Not available

Item	Description	Setting	Display
ON/OFF	Switches between ON and OFF.	○	○
Operation mode switching	Switches between Cool/Dry/Fan/Auto/Setback/Heat.	○	○
Hold	Switches between enable and disable the Hold function. If the Hold function is enable, the following functions will be prohited. Timer/Schedule (Weekly timer) /Auto return/Auto-OFF timer	○	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○	○
Fan speed setting	Changes fan speed. * Available fan speeds vary depending on the model.	○	○
Air flow direction setting	Changes airflow direction. * Available airflow directions vary depending on the model.	○	○
Louver setting	Switches between louver ON/OFF.	○	○
Ventilation equipment control	Interlocked setting and interlocked operation setting with City Multi Lossnay units can be performed. The Stop/Low/High settings of the ventilation equipment can be controlled.	○	○
Auto descending panel *1	Raises and lowers the automatic elevating panel.	○	○
Touch panel & Backlit full color LCD	Pressing any button turns the backlight on and it will stay lit for a certain period of time depending on the screen. The color of the background can be changed.	○	○
Main display mode setting	The Main display can be displayed in two different modes: "Full" and "Basic." The icon explanation setting can be enabled or disabled.	○	○
Clock *2	Date (year/month/day) and time (hour/minute) can be set. The set time as well as the day of the week will be displayed on the Main display. It is also possible to set not to display the time on the Main display. The clock can be displayed in 12-hour format (AM/PM before or after the time) and 24-hour format.	○	○
Daylight saving time	The start/end time for daylight saving time can be set. The daylight saving time function will be activated based on the settings.	○	×
Room temp. display	The room temperature display can be enabled or disabled.	—	○
Error information	When an error occurs, an error code and the unit address appear. Air conditioning unit model, serial number, and contact number can be set to appear when an error occurs. (The information above needs to be entered in advance.) * An error code may not appear depending on the error.	—	○
Filter information	A filter sign will appear when it is time to clean the filter.	—	○
Touch panel	The touch panel can be cleaned and calibrated.	○	—
Bluetooth connection, Bluetooth, Screen update	The Bluetooth connection information can be acquired. Using an Application, a logo image as well as settings data can be sent to the remote controller.	○	○
Remote controller information	The version of the remote controller can be checked.	—	○

2. Schedule and timer setting

○: Available ×: Not available

Item	Description	Setting	Display
Timer	ON/OFF timer Turns ON and OFF daily at a set time. • Time can be set in 5-minute increments. • It is also possible to set the ON time only or the OFF time only. Auto-OFF timer Turns off the unit after a certain period of operation. • Operation time can be set to a value from 30 to 240 minutes in 10-minute increments.	○	○
Weekly timer	Weekly ON/OFF times and set temperatures can be set. • Time can be set in 5-minute increments. Up to 8 schedule patterns can be set per day of the week. * Not valid when the ON/OFF timer is set.	○	○

3. Restriction settings

○: Available ×: Not available

Item	Description	Setting	Display
Allows/disallows local operation	The following operation can be prohibited by applying certain settings on the centralized controller: ON/OFF, operation mode setting, temperature setting, and filter sign reset. * While an operation is prohibited, the operation icon lights up (only on the Main display in "Full" mode).	×	○
Operation lock	The following operations can be prohibited: “Location,” “On/Off,” “Mode,” “Set temp.,” “Menu,” “Fan,” “Louver,” “Vane,” or “Hold.”	○	○
Temperature range restriction	The room temperature range for each operation mode can be restricted.	○	○
Auto return	The units operate at the preset temperature after a designated period. (Time can be set to a value from 30 to 120 minutes in 10-minute increments.) * Not valid when the temperature setting range is restricted.	○	×
Password	Administrator password (required for schedule setting etc.) and Maintenance password (required for test run and function setting etc.) can be set.	○	×

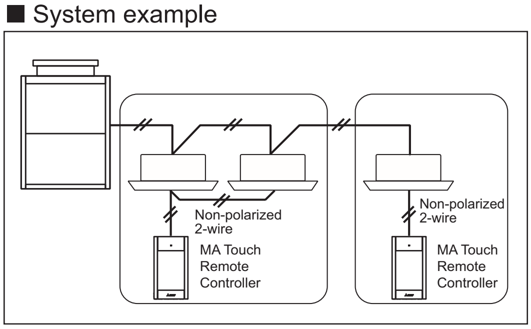
4. Miscellaneous items

○: Available ×: Not available

Item	Description	Setting	Display
Language Selection	English, French, Spanish	○	○
Brightness	The brightness of the LCD can be adjusted. The "Stay lit" setting can be enabled or disabled.	○	○
Manual vane Angle *1	Fixes the vane position for each air outlet.	○	×
Service *1	Contains Test run, Function setting, Request code, and Error history.	○	○
Design	The color of the background or character can be changed.	○	○

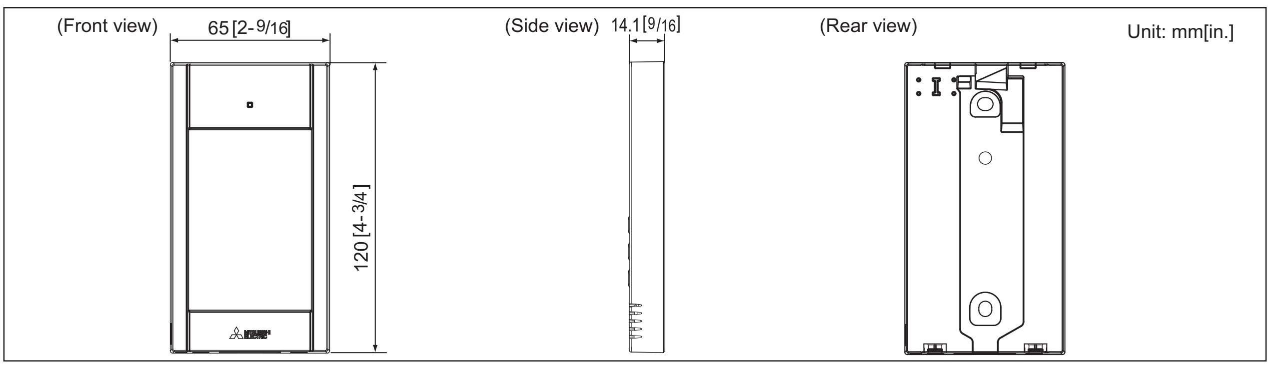
*1 This function is active only for the units that support the function.
*2 The clock is accurate within 50 seconds per month (at the temperature of 25ºC [77°F]). The clock is backed up for 7 days.

■ System example

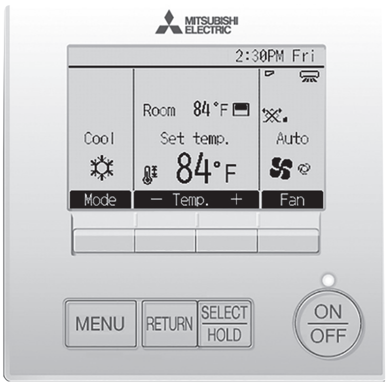


*When a PAR-CT01MAU is connected to a group, no other MA remote controllers can be connected to the same group.

■ External dimension



2-2. MA remote controller [PAR-40MAAU]



Dual Set Point

- Backlit LCD
- Can be set and shown by 1°F/0.5°C.

■ Functions

1. Operation/Display

○: Available ×: Not available

Item	Description	Setting	Display
ON/OFF	Switches between ON and OFF.	○	○
Operation mode switching	Switches between Cool/Dry/Fan/Auto/Setback/Heat.	○	○
Hold	Switches between enable and disable the Hold function. If the Hold function is enable, the following functions will be prohibited. ON/OFF timer/Schedule (Weekly timer) /Auto return/ Auto-OFF timer	○	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○	○
Fan speed setting	Changes fan speed. * Available fan speeds vary depending on the model.	○	○
Air flow direction setting	Changes airflow direction. * Available airflow directions vary depending on the model.	○	○
Louver setting	Switches between louver ON/OFF.	○	○
Ventilation equipment control	Interlocked setting and interlocked operation setting with City Multi Lossnay units can be performed. The Stop/Low/High settings of the ventilation equipment can be controlled.	○	○
Auto descending panel *1	Raises and lowers the automatic elevating panel.	○	×
Main display mode setting	The Main display can be displayed in two different modes: "Full" and "Basic."	○	○
B&W inversion	The colors of the display can be inverted, turning white background to black and black characters to white.	○	○
Clock *2	Date (year/month/day) and time (hour/minute) can be set. The set time as well as the day of the week will be displayed on the Main display. It is also possible to set not to display the time on the Main display. The clock can be displayed in 12-hour format (AM/PM before or after the time) and 24-hour format.	○	○
Daylight saving time	The start/end time for daylight saving time can be set. The daylight saving time function will be activated based on the setting contents.	○	×
Room temp. display	The room temperature display can be enabled or disabled.	—	○
Error information	When an error occurs, an error code and the unit address appear. The air-conditioning unit model, serial number, and contact number can be set to appear when an error occurs. (The above information needs to be entered in advance.) * An error code may not appear depending on the error.	—	○
Filter information	A filter sign will appear when it is time to clean the filter.	—	○
Remote controller information	The version of the remote controller can be checked.	—	○

2. Schedule and timer setting

○: Available ×: Not available

Item	Description	Setting	Display
Timer	ON/OFF timer Turns ON and OFF daily at a set time. • Time can be set in 5-minute increments. • It is also possible to set the ON time only or the OFF time only. Auto-OFF timer Turns off the unit after a certain period of operation. • Operation time can be set to a value from 30 to 240 minutes in 10-minute increments.	○	○
Weekly timer	Weekly ON/OFF times and set temperatures can be set. • Time can be set in 5-minute increments. Up to 8 schedule patterns can be set per day of the week. * Not valid when the ON/OFF timer is set.	○	○

3. Restriction settings

○: Available ×: Not available

Item	Description	Setting	Display
Allows/disallows local operation	The following operation can be prohibited by applying certain settings on the centralized controller: ON/OFF, operation mode, set temperature, filter sign reset, air direction, fan speed and timer. * While an operation is prohibited, the operation icon lights up (only on the Main display in the "Full" mode).	×	○
Operation lock	The following operations can be prohibited: "Location," "On/Off," "Mode," "Set temp.," "Menu," "Fan," "Louver," "Vane," or "Hold."	○	○
Temperature range restriction	The room temperature range for each operation mode can be restricted.	○	○
Auto return	The units operate at the preset temperature after a designated period. (Time can be set to a value from 30 to 120 minutes in 10-minute increments.) * Not valid when the temperature setting range is restricted.	○	×
Password	Administrator password (required for schedule setting etc.) and Maintenance password (required for test run and function setting etc.) can be set.	○	×

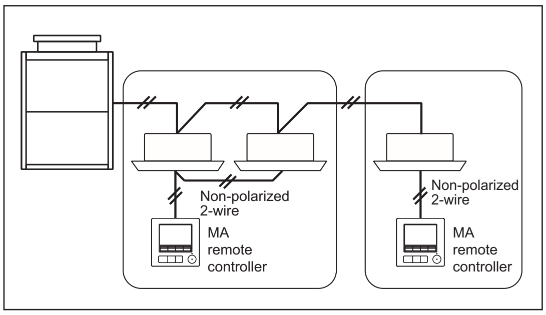
4. Miscellaneous items

○: Available ×: Not available

Item	Description	Setting	Display
Language Selection	Select the display language from the following 3 languages. English, French, Spanish	○	○
Brightness Contrast	The brightness of the LCD can be adjusted. The contrast of the LCD can be adjusted.	○	○
Manual vane Angle *1	Fixes the vane position for each air outlet.	○	×
Service *1	Contains Test run, Function setting, Request code, and Error history.	○	○
3D i-see Sensor	Settings for 3D i-see Sensor can be made.	○	○

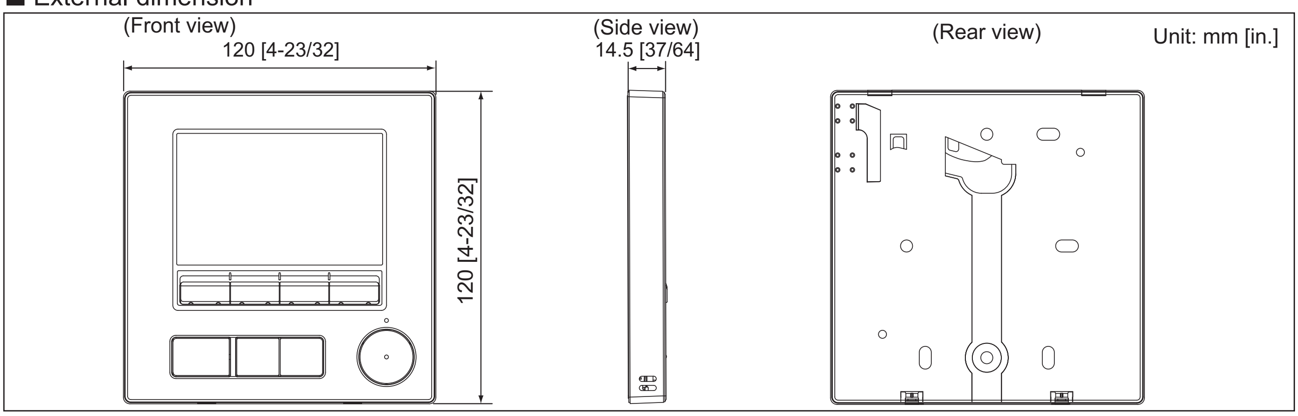
*1 This function is active only for the units that support the function.
*2 The clock is accurate within 45 seconds per month (at the temperature of 77°F [25ºC]). The clock is backed up for 3 days.

■ System example



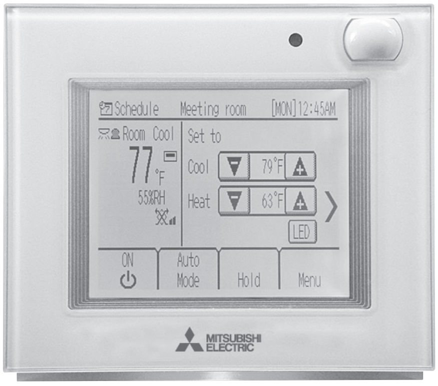
*When a PAR-40MAAU is connected to a group, no other MA remote controllers can be connected to the same group.

■ External dimension



2-3. ME remote controller [PAR-U01MEDU]

Dual Set Point



- ME remote controller is a remote controller designed to control Mitsubishi Electric's air conditioning units and also allows for the control of other manufacturer's products connected via Mitsubishi Electric's AHC (Advanced HVAC CONTROLLER).
- It can control up to sixteen indoor units and one AHC.
- ME remote controller features such basic functions as operations and monitoring of air conditioning units and schedule-control functions and is equipped with four built-in sensors (temperature, humidity, occupancy, brightness), which enable an integrated control of the system, including the humidifiers and ventilation units connected to the system via AHC, to help create a comfortable environment. When the built-in occupancy sensor detects vacancy in a specific zone, the controller uses its internal function to reduce energy-consumption.

■ Functions

1. Operation/Display

○: Available ×: Not available

Item	Description	Setting	Display
ON/OFF	Switches between ON and OFF.	○	○
Operation mode switching	Switches between Cool/Drying/Fan/Auto/Setback/Heat. *Available operation mode varies depending on the model.	○	○
Hold	Switches between enable and disable the Hold function. If the Hold function is enable, the following functions will be prohited. Timer/Schedule (Weekly timer) /Auto return	○	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○	○
Fan speed setting	Changes fan speed. * Available fan speeds vary depending on the model.	○	○
Air flow direction setting	Changes airflow direction. * Available airflow directions vary depending on the model.	○	○
Louver setting	Switches between louver ON/OFF. * Available Louver setting vary depending on the model.	○	○
Ventilation equipment control	Interlocked setting and interlocked operation setting with City Multi Lossnay units can be performed. The Stop/Low/High settings of the ventilation equipment can be controlled.	○	○
Backlight	Touching the screen turns the backlight on. It will stay lit for the amount of time that was specified on the MENU screen.	○	○
Clock display	Date (year/month/day) and time (hour/minute) can be set. The set time as well as the day of the week will be displayed on the Home display. The clock can be displayed in 12-hour format (AM/PM before or after the time) and 24-hour format.	○	○
Daylight saving	Sets the daylight saving time period.	○	×
Room temp./ humidity display	Displays the room temperature and humidity on the Home display.	—	○
Error information	When an error occurs, an error code and the unit address appear. A contact number can be set to appear when an error occurs. (The above information needs to be entered in the Service menu.)	—	○
Filter information	A filter sign will appear when it is time to clean the filter.	—	○

2. Schedule and timer setting

○: Available ×: Not available

Item	Description	Setting	Display
Schedule (Weekly timer)	Weekly ON/OFF times, operation mode, and set temperatures can be set. • Time can be set in 5-minute increments. Up to 8 schedule patterns can be set per day of the week. * Not valid when the ON/OFF timer is set.	○	○
Timer	ON/OFF timer Turns ON and OFF daily at a set time. • Time can be set in 5-minute increments. • It is also possible to set the ON time only or the OFF time only. Auto-OFF timer Turns off the unit after a certain period of operation. • Operation time can be set to a value from 30 to 240 in 10-minute increments.	○	○

3. Energy-save control assist function

○: Available ×: Not available

Item	Description	Setting	Display
Energy-save control during vacancy	When vacancy is detected by the occupancy sensor, the energy-save control assist function is activated. Five control types are available for selection: ON/OFF/Operation mode/Set temperature/Fan speed/Thermo-off. The brightness sensor can be used in conjunction with the occupancy sensor to detect the occupancy/vacancy status more accurately.	○	○

4. Restriction settings

○: Available ×: Not available

Item	Description	Setting	Display
Allows/disallows local operation	The following operation can be prohibited by applying certain settings on the centralized controller: ON/OFF, operation mode setting, temperature setting, fan speed, air direction, and filter sign reset. * While an operation is prohibited, the operation icon lights up.	×	○
Operation lock	The following operation can be prohibited respectively: ON/OFF, operation mode setting, temperature setting, Hold setting, and airflow direction setting.	○	○
Temperature range restriction	The room temperature range for each operation mode can be restricted.	○	○
Auto return	The units operate at the preset temperature after a designated period. (Time can be set to a value from 10 to 120 in 10-minute increments.) * Not valid when the temperature setting range is restricted.	○	×
Password	User password (required for schedule setting etc.) and Service password (required for test run and function setting etc.) can be set.	○	×

5. AHC control functions

○: Available ×: Not available

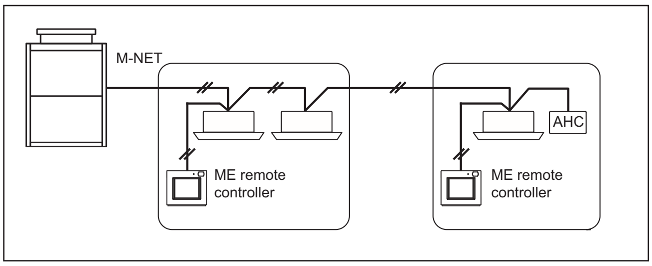
Item	Description	Setting	Display
Status monitor	Displays the status of general equipments connected to the AHC.	×	○
Humidity setting	Sets the humidity level in 1% increments for the humidifier connected to the AHC, if any.	○	○

6. Miscellaneous items

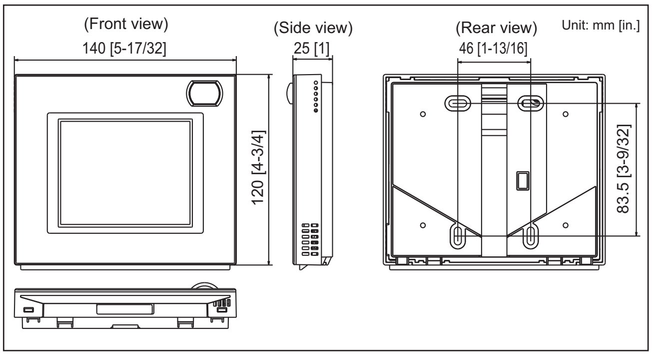
○: Available ×: Not available

Item	Description	Setting	Display
Service	Contains Set up, Error history, and Test run.	○	○

■ System example



■ External dimension



2-4. Simple MA remote controller [PAC-YT53CRAU]

Dual Set Point

- Control: ON/OFF, room temperature, vane, fan speed, and operation mode
- The only wiring required is cross-over wiring based on two-wire signal lines.
- Room temperature sensors are built-in.
- Set temperature range limit
- Can operate all types of indoor units
  - ∗: Since this controller has limited functions, it should always be used in conjunction with standard controller or centralized controller.
- Backlit LCD
- Flat back

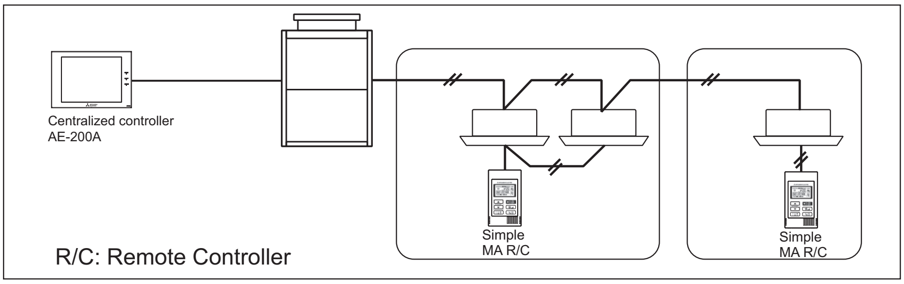
■ Functions

○: Available ×: Not available

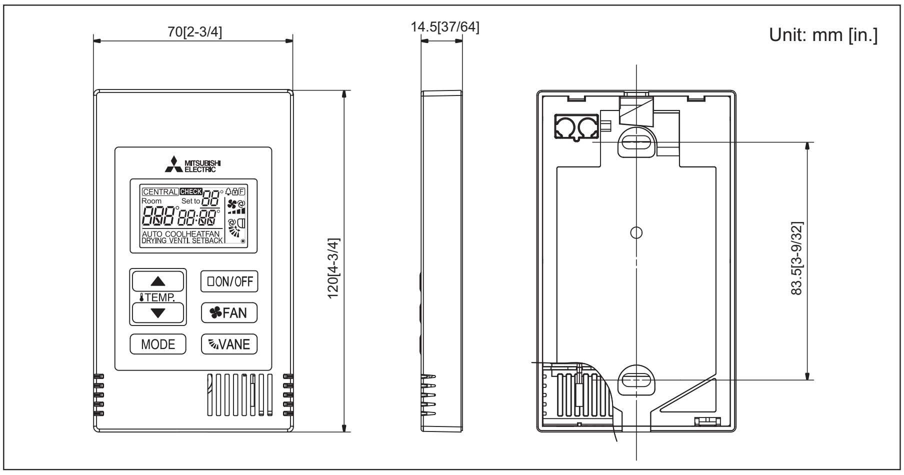
Item	Description	Setting	Display
ON/OFF	Changes between ON and OFF.	○	○
Operation mode switching *1	Select from COOL, DRYING, FAN, AUTO, and HEAT.	○	○
Temperature setting *1	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○	○
Fan speed setting	Changes the fan speed. *The settable fan speed varies depending on the indoor unit model to be connected.	○	○
Vane setting	Switches the vane directions. *The settable vane direction varies depending on the indoor unit model to be connected.	○	○
Ventilation equipment control	Interlocked setting and interlocked operation setting with City Multi Lossnay units can be performed. The Stop/Low/High settings of the ventilation equipment can be controlled.	○	○
Backlight	Pressing the button lights up a backlight. The light automatically turns off after a certain period of time. (The brightness settings can be selected from Bright, Dark, and Light off.)	○	○
Error information	Displays the current error status with the address. *The address may not be displayed depending on the error status.	–	○
Allows/disallows local operation	By setting a centralized controller, the following local operations can be prohibited: ON/OFF, operation mode, preset temperature; *The CENTRAL icon appears while local operations are prohibited.	×	○
Operation lock	Locks all buttons.	○	○
Temperature range restriction	The preset temperature range can be restricted for each operation mode (COOL/HEAT/AUTO).	○	○
Room temperature detection	The temperature sensor is built-in on the remote controller.	–	–
Various settings	The following settings can be made by setting the dip switches. • Remote controller Main/Sub setting • Temperature display unit setting (Celsius/Fahrenheit) • Cooling/heating display in AUTO mode • Indoor temperature display	–	–

*1 AUTO mode is settable only when those functions are available on the indoor unit.

■ System example



■ External dimension



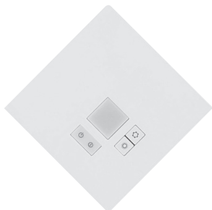
2-5. Wireless remote controller [PAR-FL32MA/PAR-SL101A-E/PAR-FA32MA/PAR-SR4LU-E/ PAR-SF9FA-E/PAR-SL94B-E]

PAR-FL32MA

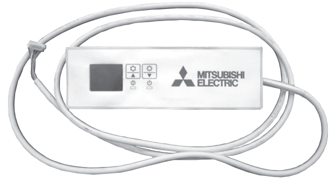
PAR-SL101A-E

PAR-FA32MA

PAR-SR4LU-E



PAR-SF9FA-E
(2×2 Cassette signal receiver)



PAR-SL94B-E
(Wireless remote controller kit for ceiling-suspended type)

■ Functions (PAR-FL32MA)

○: Available ×: Not available

Item	Description	Setting	Display
ON/OFF	ON and OFF operation for a single group	○	○
Operation mode switching	Switches between Cool/Dry/Fan/Heat/Auto. *1	○	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○	○
Fan speed setting	Models with 4 air flow speed settings: Hi/Mid-1/Mid-2/Low Models with 3 air flow speed settings: Hi/Mid/Low Models with 2 air flow speed settings: Hi/Low Auto setting varies depending on the model.	○*3	○*3
Air flow direction setting	Air flow direction angles (4-angle, Swing) Auto Louver ON/OFF. Air flow direction settings vary depending on the model.	○*3	○*3
Timer operation	One ON/OFF setting can be set per day.	○	○
Permit/Prohibit local operation	Individually prohibit operation of each local remote control function (ON/OFF, Change operation mode, Set temperature, Reset filter).	×	○*2
Indoor unit intake temperature	Measures the intake temperature of the indoor unit when the indoor unit is operating.	×	×
Error	When an error occurs on the air conditioner unit, the operation lamp on the signal receiving unit will flash.	×	○
Test run	This operates air conditioner units in test run mode.	○	○

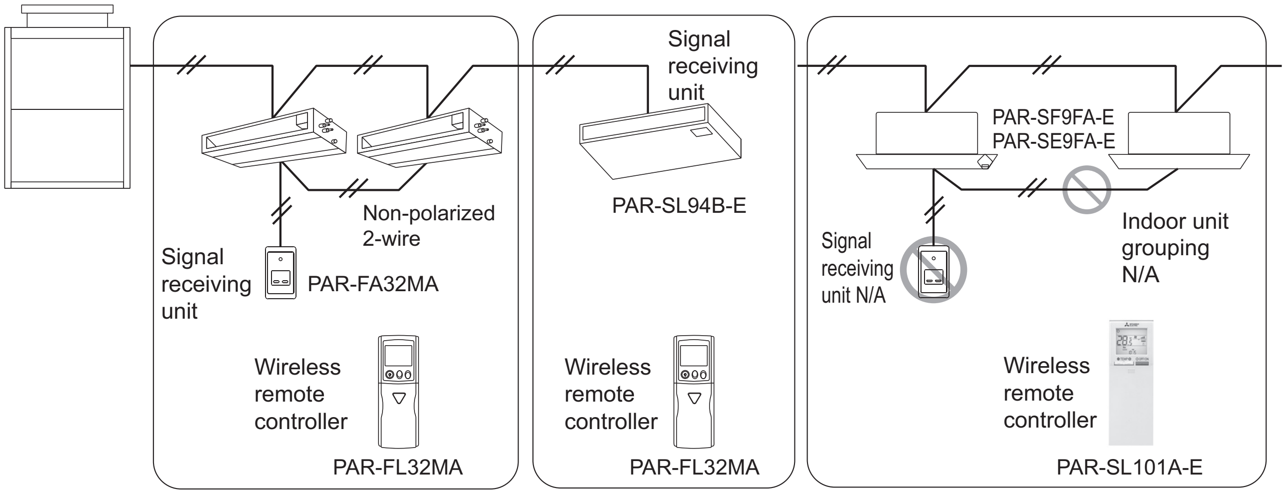
■ Functions (PAR-SL101A-E)

Item	Description	Setting	Display
OFF/ON	OFF and ON operation for a single group	○	○
Operation mode switching	Switches between Cool/Dry/Fan/Heat/Auto *1/Dual set point *1	○	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○	○
Fan speed setting	Models with 4 air flow speed settings: Hi/Mid-1/Mid-2/Low Models with 3 air flow speed settings: Hi/Mid/Low Models with 2 air flow speed settings: Hi/Low Auto setting varies depending on the model.	○*3	○*3
Air flow direction setting	Air flow direction angles (4-angle, Swing) Auto Louver ON/OFF. Air flow direction settings vary depending on the model.	○*3	○*3
Timer operation	One OFF/ON setting can be set for one day.	○	○
Permit/Prohibit local operation	Individually prohibit operation of each local remote control function (OFF/ON, Change operation mode, Set temperature, Reset filter).	×	○*2
Indoor unit intake	Measures the intake temperature of the indoor unit when the indoor unit is operating.	×	×
Error	When an error occurs on the air conditioner unit, the operation lamp on the signal receiving unit will flash.	×	○
Test run	This operates air conditioner units in test run mode.	○	○
Individual vane settings	The airflow directions of the four vanes can each be adjusted independently. Easily set the optimum airflow according to the room setting.	○	×
3D i-see Sensor (Direct/Indirect Airflow)	Pressing the i-see button enables direct or indirect setting of all vanes.	○	×

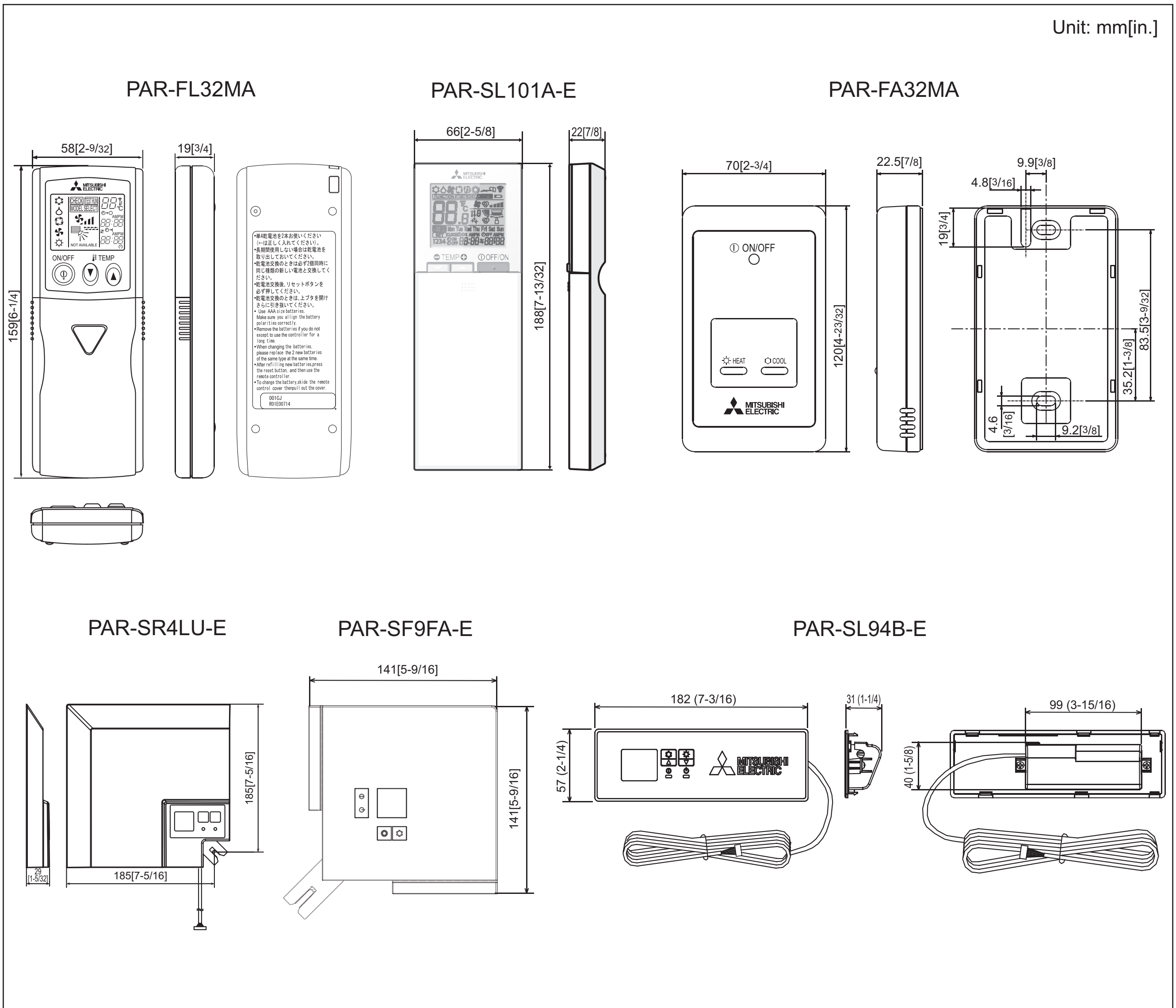
*1. Auto only supported for the Cit Multi R2- and WR2-Series. Operation modes vary depending on the air conditioner unit.
*2. If operation is performed when the local remote controller inactivation command is received from the main system controller, a buzzer will sound an LED will flash.
*3. Some models will have different display for the air flow direction and fan speed. Set the flow direction and fan speed when performing initial setting.

CONTROLLER

■ System example



■ External dimension



2-6. Lossnay remote controller [PZ-61DR-E]

- Stand-alone Lossnay operation is possible by commands from a centralized controller or Lossnay remote controller.
  (AE-200A/AE-50A/EW-50A/TC-24B are centralized controllers that support Lossnay operation.)
- The Lossnay remote controller is capable of changing the air flow and vent modes.
- All the wiring is cross-wiring that uses non-polar two wire system signal cables.

  * It is possible to use a Lossnay remote controller for Lossnay unit that is interlocked with other indoor units.
  * It is not possible to connect to LGH-F-RX5-E.

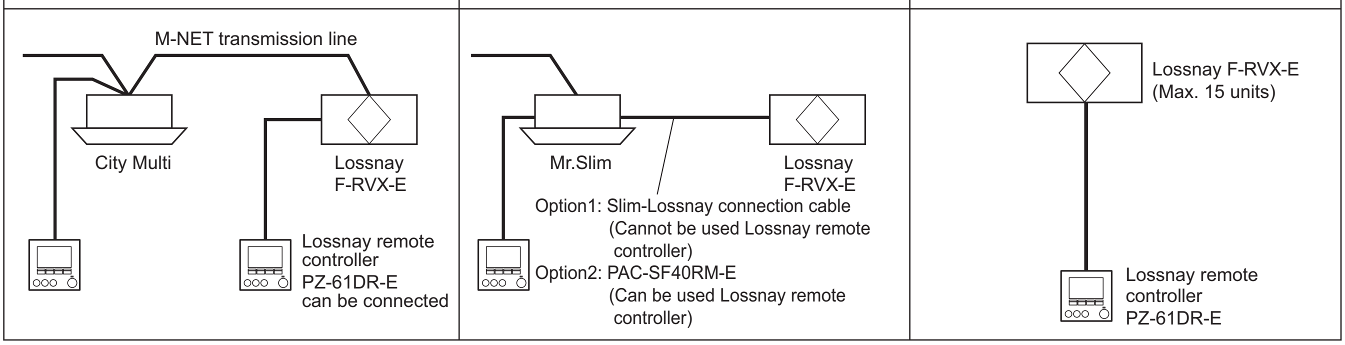
■ Functions (in case of LGH-F-RVX-E)

Function (Communicating mode)	PZ-61DR-E
Fan speed selection	4 fan speeds
Ventilation mode selection	Energy recovery/Bypass/Auto
Night-purge (time and fan speed)	Yes
Function setting from RC	Yes
Bypass temp. free setting	Yes
Heater-On temp. free setting	Yes
Fan power up after installation	Yes
0 - 10VDC external input	Yes
ON/OFF timer	Yes
Auto-Off timer	Yes
Weekly timer	Yes
Operation restrictions (ON/OFF, Ventilation mode, fan speed)	Yes
Operation restrictions (fan speed skip setting)	Yes
Screen contrast adjustment	Yes
Language selection	Yes (8 languages)*
Initializing	Yes
Filter cleaning sign	Yes
Lossnay core cleaning sign	Yes
Error indication	Yes
Error history	Yes
OA/RA/SA temp. display	Yes

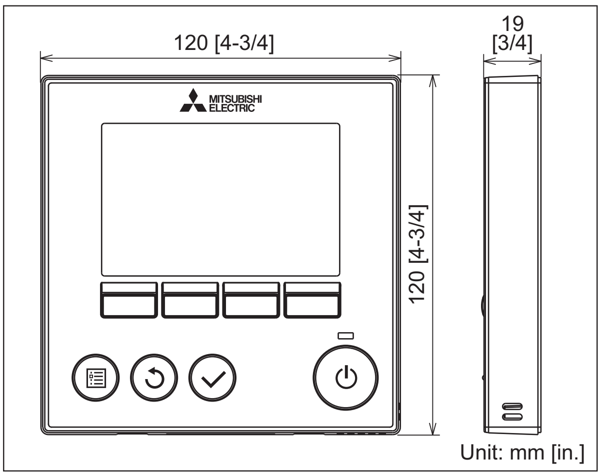
* The 8 languages are English, German, French, Spanish, Italian, Portuguese, Russian, and Swedish.

■ System example

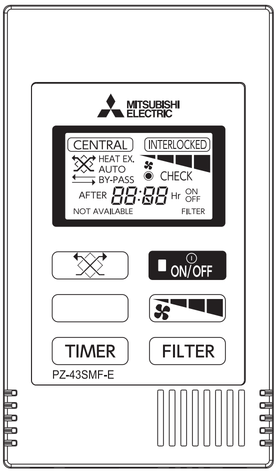
Interlocked with air conditioners		Lossnay units only
Interlocked with City Multi	Interlocked with Mr.Slim	



■ External dimension



2-7. Lossnay remote controller [PZ-43SMF-E]



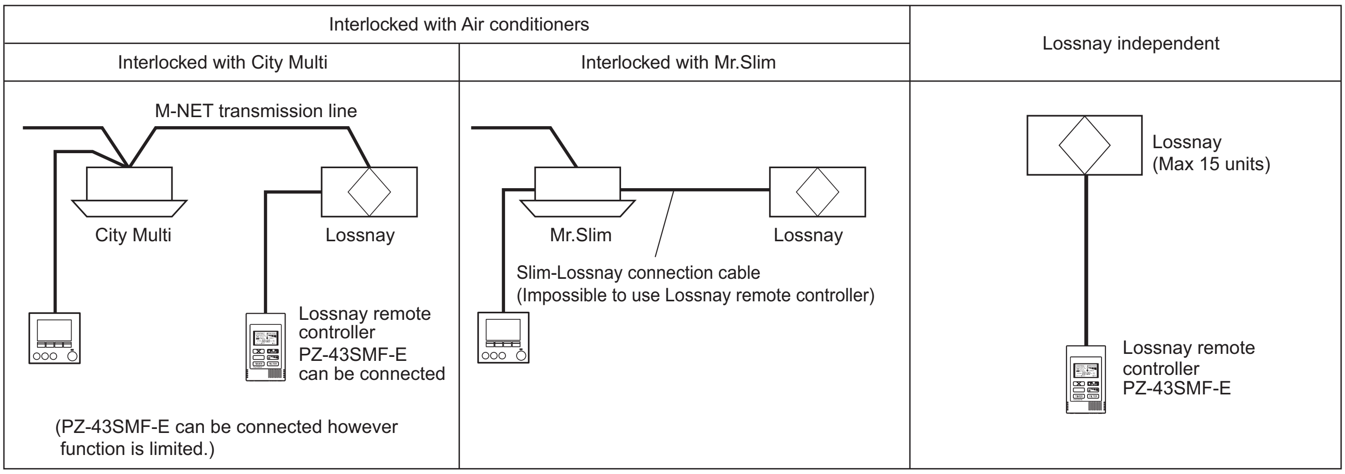
- Stand-alone Lossnay operation is possible by commands from a centralized controller or Lossnay remote controller. (AE-200A/AE-50A/EW-50A/TC-24B are centralized controllers that support Lossnay operation.)
- The Lossnay remote controller is capable of changing the air flow and vent modes.
- All the wiring is cross-wiring that uses non-polar two wire system signal cables.

* It is possible to use a Lossnay remote controller for Lossnay unit that is interlocked with other indoor units.

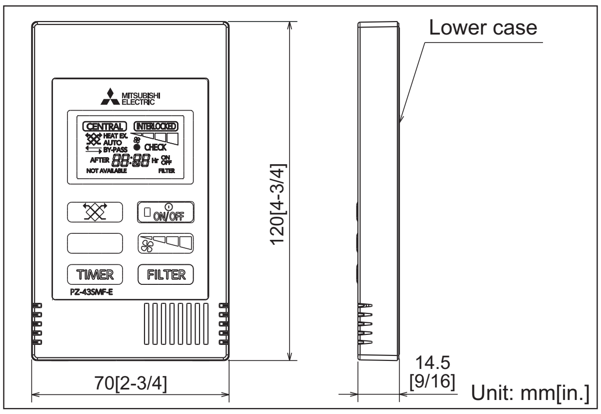
■ Functions

Operation	Relevant button	Revevant display items	Sequence
Starting the Lossnay unit	ON/OFF	HEAT EX. AUTO	Press the "ON/OFF" button and check that the operation lamp turns on.
Setting the Ventilation mode		HEAT EX. AUTO	Press the "Ventilation mode" button: Each time it is pressed, the corresponding display will change in accordance with the sequence [HEAT EX.] (non-automatic) --> [BY-PASS] (non-automatic) --> [AUTO]. If [AUTO] is selected, the display will change to indicate the current mode after three seconds have passed.
Selecting the fan speed		HEAT EX. AUTO	Press the "Fan Speed" button to select either Low or High fan speed.
Stopping the Lossnay unit	ON/OFF Operation lamp		Press the "ON/OFF" button. (and check the operation lamp turns off.)
OFF timer	TIMER	HEAT EX. AUTO AFTER 0:30 Hr OFF	**Press the "TIMER" button during operation.** 0:30 (Initial) Increasing 0:30 by pressing it once. **Available setting time: 0:30 - 24:00** * Keep pressing the button for fast-forwarding. Release the button for cancelling the fast-forwarding. Timer setting will be cancelled by pressing "ON/OFF" button.
ON timer	TIMER	AFTER 5:30 Hr ON	**Press the "TIMER" button during non-operation.** 5:30 (Initial) Increasing 0:30 by pressing it once. **Available setting time: 0:30 - 24:00** * Keep pressing the button for fast-forwarding. Release the button for cancelling the fast-forwarding. Timer setting will be cancelled by pressing "ON/OFF" button.

■ System example

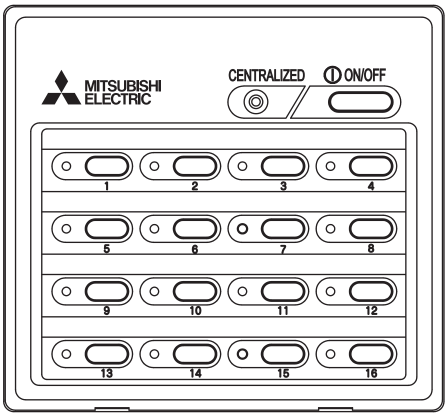


■ External dimension



3-1. ON/OFF remote controller [PAC-YT40ANRA]

Dual Set Point



- Control of up to 16 groups/50 indoor units is possible.
  - Up to 16 groups/50 units can be operated with one ON/OFF remote controller.
  - A general-purpose interface is available for control, allowing general devices to also be turned ON and OFF.
- Just press a switch to start.
  - All of the units can be started and stopped by pressing the main switch, and each unit in the group can be started and stopped with individual switches.
- LED flashing during failure.
  - If any error should occur in the air conditioner, its details can be confirmed easily with the flashing LED. The LED also indicates whether each group is running or stopped.
- Interlock operation with external system is possible.
  - It can be flexibly interlocked with a card reader, fire alarm system, or building management system, etc., using the incorporated external input/output function.
- Flexible group setting.
  - Groups can be easily configured, allowing the group pattern to be freely set according to the layout.
  - The ON/OFF remote controller can be connected at the indoor/outdoor transmission line without the power supply unit.

■ Functions

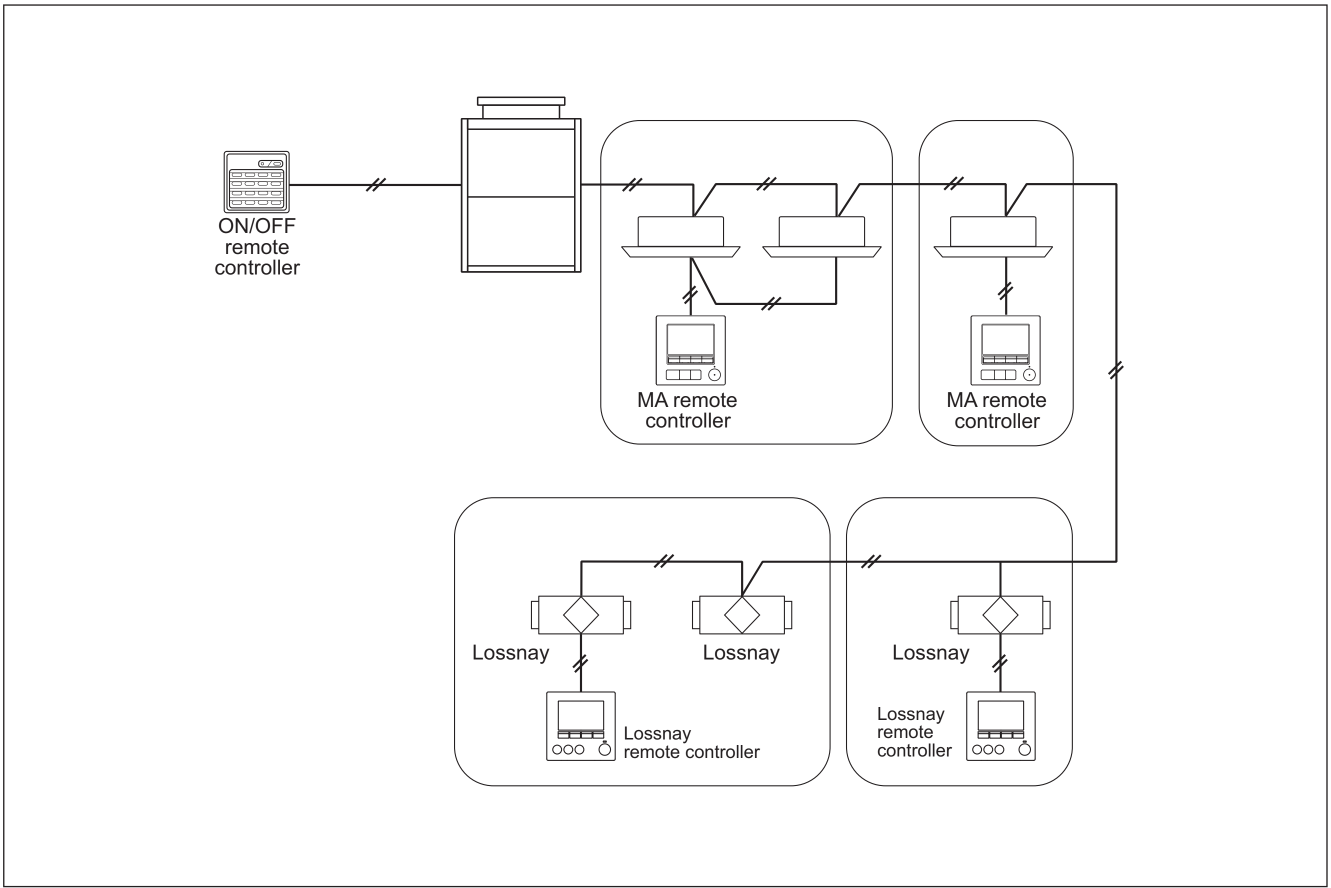
○: Each group　△: Each floor
◎: Group or collective　×: Not available

Item	Description	Operations	Display
ON/OFF	ON and OFF operation for the air conditioner units	◎	◎
Operation mode switching	Not available	×	×
Temperature setting	Not available	×	×
Fan speed setting	Not available	×	×
Air flow direction setting	Not available	×	×
Manual operation prohibit/permit (ON/OFF, operation mode, setting temperature, filter reset)	Compatible only with external input.	×	×
Specific mode operation prohibit (Cooling prohibit, heating prohibit, cooling/heating prohibit)	Not available	×	×
Room temperature display	Not available	–	×
Error display	LED flashes during failure. (The error code can be confirmed by removing the cover.)	–	△
Schedule operation	Not available	×	×
Ventilation operation (independent)	Group operation is only possible with Lossnay units. ✻ Only ON/OFF of group.	○	○
Ventilation operation (interlocked)	The Lossnay will run in interlock with the operation of the indoor unit. ✻ The fan rate and mode cannot be changed. The LED will turn ON only during operation after interlocking.	△	△
External input (Timer connection, emergency stop input, etc.)	The following can be input with the level signals or pulse signals. Level signal: "Emergency stop input" or "Collective ON/OFF" Pulse signal: "Collective ON/OFF" or "Local remote controller prohibit/permit" One input can be selected from those above.	◎	–
External output (Error output, operation output)	"ON/OFF" and "error/normal" are output with the level signal. ✻ The optional output cable is required.	–	◎

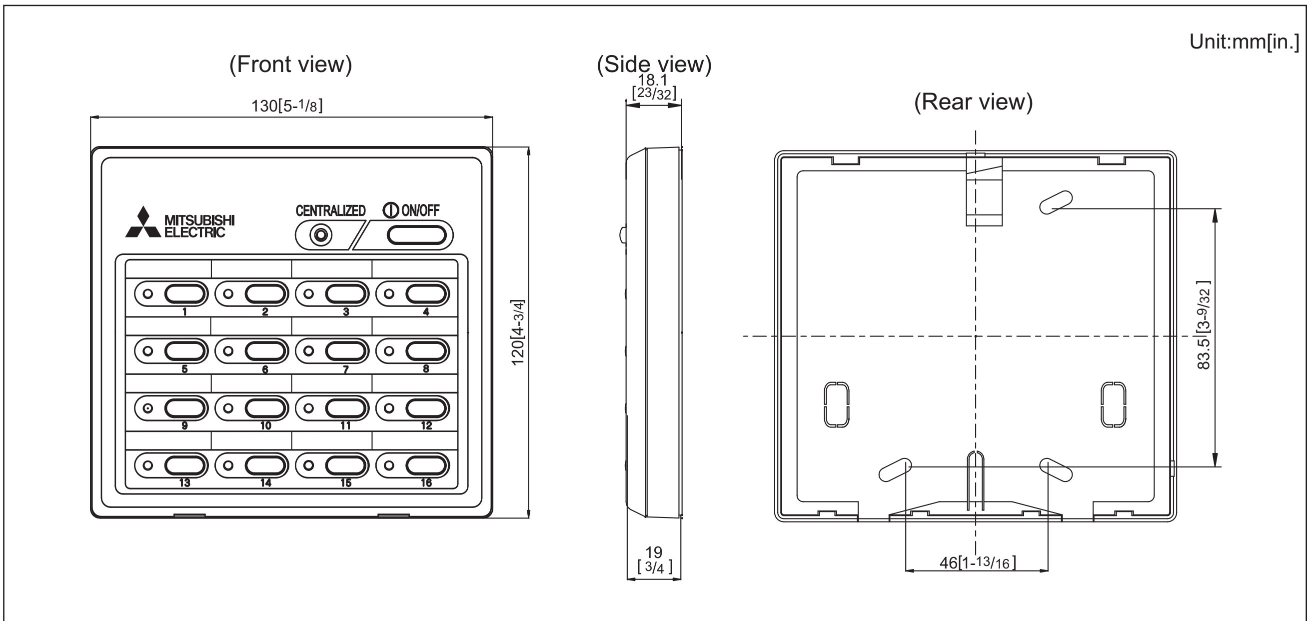
NOTE

The dual set point function is available depending on the controller version.
Please contact your local distributor regarding the availability of this function.

■ System example



■ External dimension



3-2. Touch controller [TC-24B]

Dual Set Point

- TC-24B features a 5 inch wide color LCD touch panel. The settings for air conditioning units can be changed by touching the corresponding icons on the display. On the panel of TC-24B are 3 buttons; ON/OFF, SETBACK and HOLD enabling simple and quick operation.
- One TC-24B can control up to 24 groups/units of air conditioners.
- Operation status displayed on easy-to-read LCD. The group currently operating can be seen at a glance with the operation status display. TC-24B operation is limited to basic functions such as ON/OFF, Operation mode changeover, temperature setting and Prohibit operation by local remote controller.
- Up to 12 patterns of weekly schedule can be set. "ON/OFF", "Operation mode", "Set Temperature", "Fan speed", "Air flow direction" and "Permit / Prohibit local operation" can be scheduled with up to 16 settings in one pattern. Up to 5 patterns of today's schedule can be set.
- Independent Lossnay operation is possible. Automatic ventilation, Normal ventilation and Ventilation with heat exchanger can be switched from the system controller.
- TC-24B is equipped with a system changeover function which an operation mode can be switched to an optimal mode depending on indoor temperature setting and target temperature of each group or a representative indoor unit.

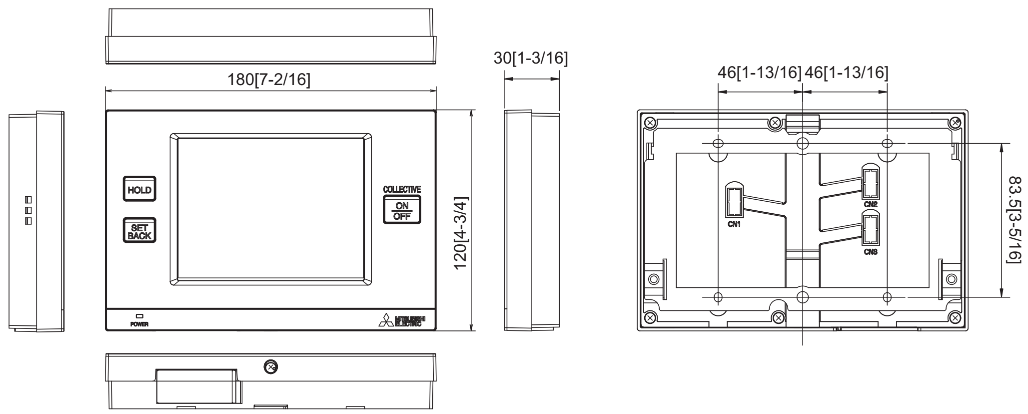
■ Functions

□: Each unit ○: Each group ●: Each block
◎: Group or collective ×: Not available

Item	Description	Operations	Display
ON/OFF	ON and OFF operation for the air conditioner units. Even when only a single indoor unit connected to the touch controller will operate and collective ON/OFF lamp will light up.	◎	◎
Operation mode switching	Switches between Cool/Drying/Auto/Fan/Heat/Setback. Operation modes vary depending on the air conditioner unit. Auto mode and Setback mode are for CITY MULTI R2/H2i (R2)/WR2-Series only.	◎	◎
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	◎	◎
Fan speed setting	Models with 5 air flow speed settings: Hi/Mid-1/Mid-2/Low, Auto Models with 4 air flow speed settings: Hi/Mid-1/Mid-2/Low Models with 3 air flow speed settings: Hi/Mid/Low Models with 2 air flow speed settings: Hi/Low * Fan speed setting (including Auto) varies depending on the model.	◎	◎
Air flow direction setting	Air flow direction angles 4-angle or 5-angle, Swing, Auto Louver ON/OFF * Air flow direction settings vary depending on the model.	◎	◎
Hold	Prohibits the scheduled operation from being executed.	◎	◎
Permit/Prohibit	The ON/OFF, operation mode, setting temperature, fan speed, air direction, and filter sign reset operations using the local remote controllers can be prohibited. Only ON/OFF and filter reset can be prohibited for the Lossnay group.	◎	◎
Operation lock	Child proof. (ON/OFF, operation mode, setting temperature, fan speed, HOLD)	◎	◎
Room temperature display	The room temperature can be displayed.	×	○
Error display	When an error is occurring on an air conditioner unit, the affected unit and the error code are displayed. * When an error occurs, the "ON/OFF" LED flashes. The operation monitor screen shows an abnormal icon over the unit. The error monitor screen shows the abnormal unit address and error code. The error log monitor screen shows the time and date, the abnormal unit address, error code, and source of detection.	×	□◎
Schedule operation	Weekly schedule setting of up to 12 patterns is available. In one pattern, up to 16 settings of "ON/OFF", "Operation mode", "Set Temperature", "Fan speed", "Air flow direction", and "Permit/Prohibit local operation" can be scheduled. Today's schedule allows setting of up to 5 patterns. *Time setting unit: 5 minute /unit	○	○
Ventilation (independent)	Switches the mode "Bypass/Heat recovery/Auto" for Lossnay groups.	◎	◎
Ventilation (interlocked)	The Lossnay will run in interlock with the operation of the indoor unit. The mode cannot be changed. The LED will turn ON during operation after interlocking.	◎	◎
Temperature set limitation	Batch-setting to temperature range limit in cooling, heating, and auto modes. This function cannot be used with the MA remote controller. (Depends on the indoor unit model.)	◎	◎
System changeover	Operation mode can be switched to an optimal mode depending on indoor temperature setting and target temperature of each group or a representative indoor unit. * When this function is used, the system changeover function of the outdoor unit cannot be used.	●	–
External input (Emergency stop input, etc.)	The following input with level signals or pulse signals are available. Level signal: "Emergency stop input" or "Collective ON/OFF" Pulse signal: "Collective ON/OFF" or "Local remote controller prohibit/permit" One input can be selected from those above. * An external input/output adapter (PAC-YT51HAA-J (sold separately)) is required. Relays and DC power supply or other devices must be prepared at the site.	◎	◎
External output (Error output, operation output)	"ON/OFF" and "error/normal" are output with the level signal. * An external input/output adapter (PAC-YT51HAA-J (sold separately)) is required. Relays and DC power supply or other devices must be prepared at the site.	◎	◎

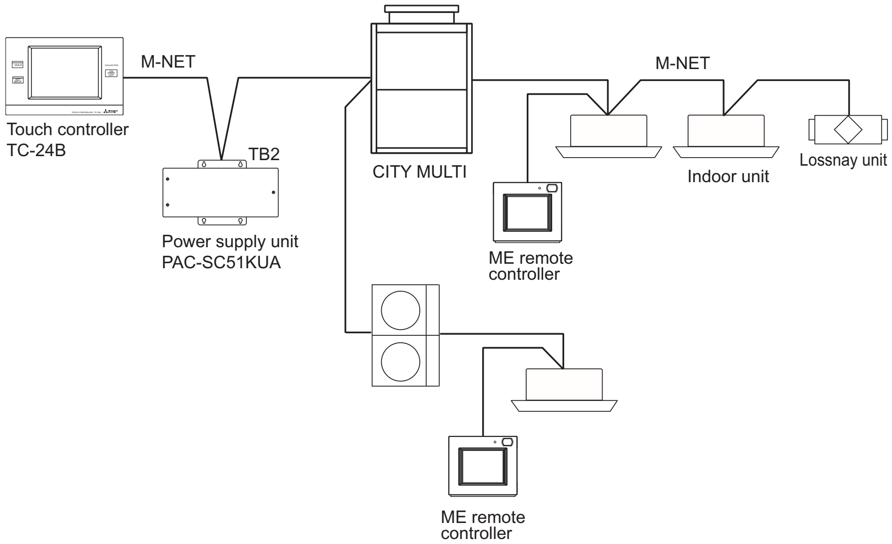
■ External dimension

Unit: mm [in.]

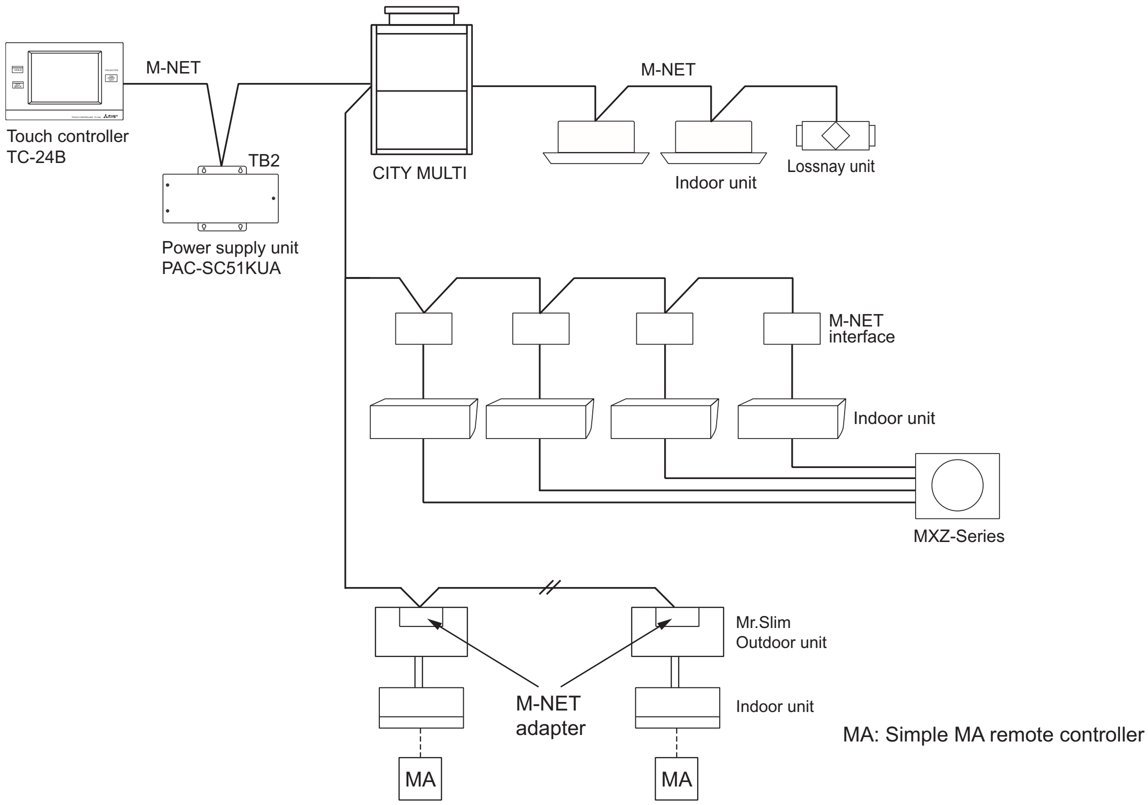


■ System example

(1) Connection with CITY MULTI units



(2) Connection with CITY MULTI and Mr.SLIM units



1. Power supply to TC-24B

TC-24B needs DC power supply of M-NET (24~32VDC) for centralized control transmission use, operation.

(1). Power supply of M-NET from power supply unit PAC-SC51KUA.
Power supply unit PAC-SC51KUA is recommended for TC-24B. See the diagram below; for details, please refer to the installation manual of Power supply unit PAC-SC51KUA

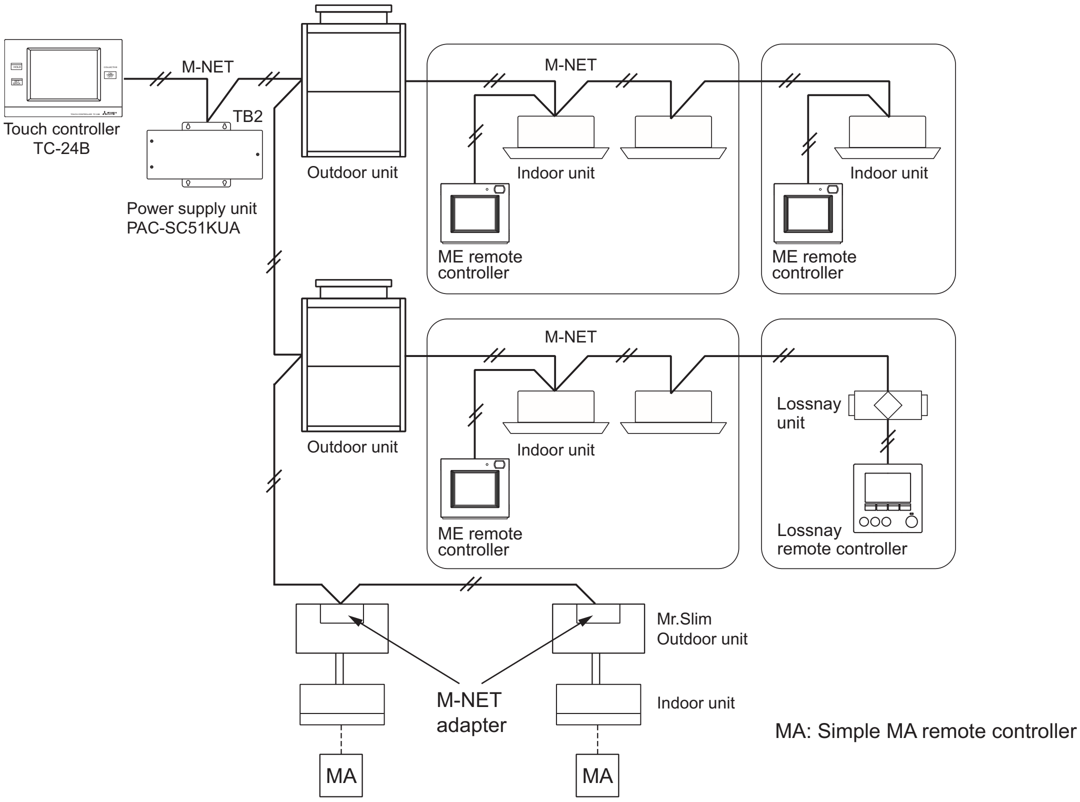


Fig. 1 Basic structure of TC-24B and PAC-SC51KUA

(2). Power supply of M-NET from outdoor unit connector TB7.
As shown on Fig. 2, TC-24B receives power supply of M-NET from R410A outdoor unit connector TB7.
In case one of the outdoor units should change its power supply, switch CN41 to CN40.
However, if the outdoor unit shuts down, TC-24B will also automatically shut down.
Therefore, this scheme is not recommended for air conditioning system consisting of multiple outdoor units.
*NOTE: This method applies to R410A CITY MULTI outdoor unit except PUMY (S-Series), PUHY/PURY-T(S)KMU, and PUHY/PURY-T(S)LMU models.

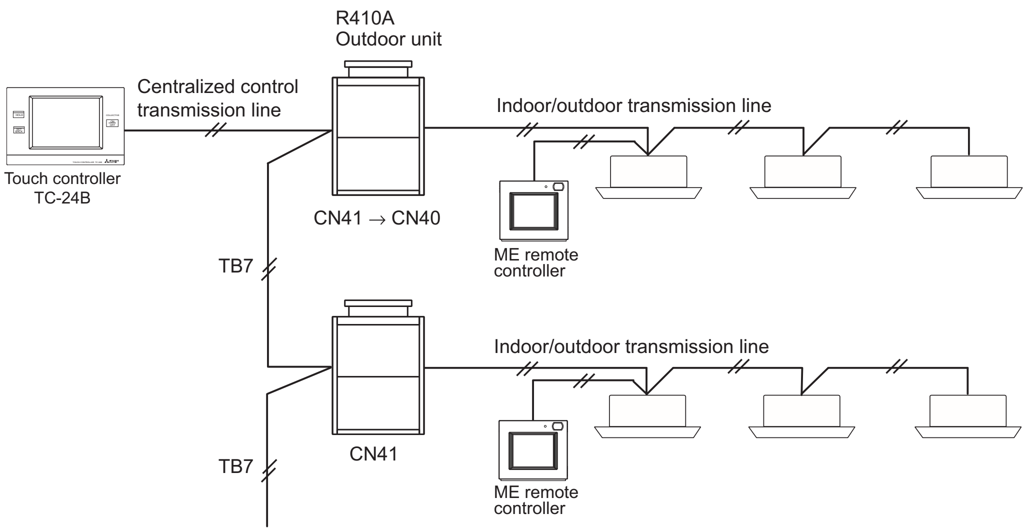


Fig. 2 TC-24B, TB7 scheme

(3). Power supply of M-NET from outdoor unit connector TB3.
TC-24B can also receive power supply from R410A/R407C/R22 outdoor unit connector TB3. However, if the outdoor unit shuts down, TC-24B will also automatically shut down. Therefore, this scheme is not recommended for air conditioning system consisting of multiple outdoor units.

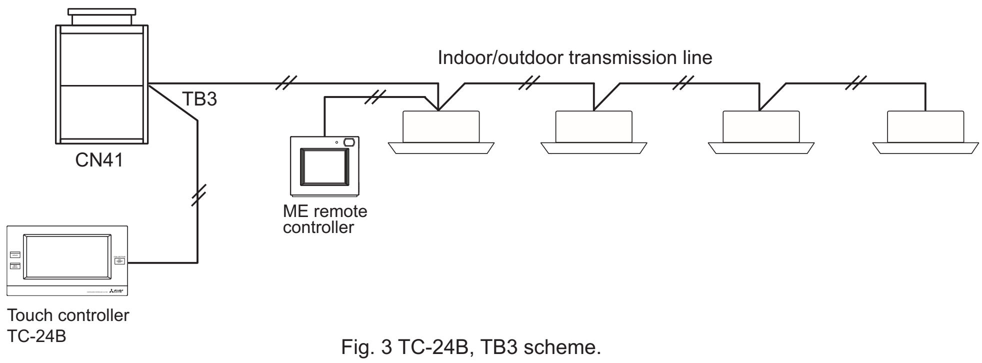
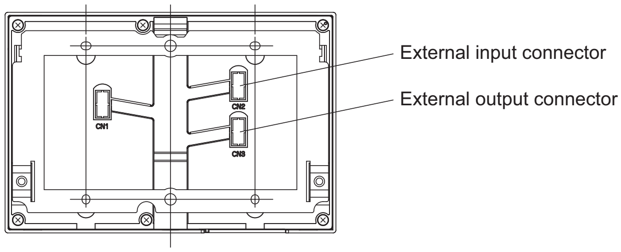


Fig. 3 TC-24B, TB3 scheme.

2. External input/output usage



(1). External signal input function

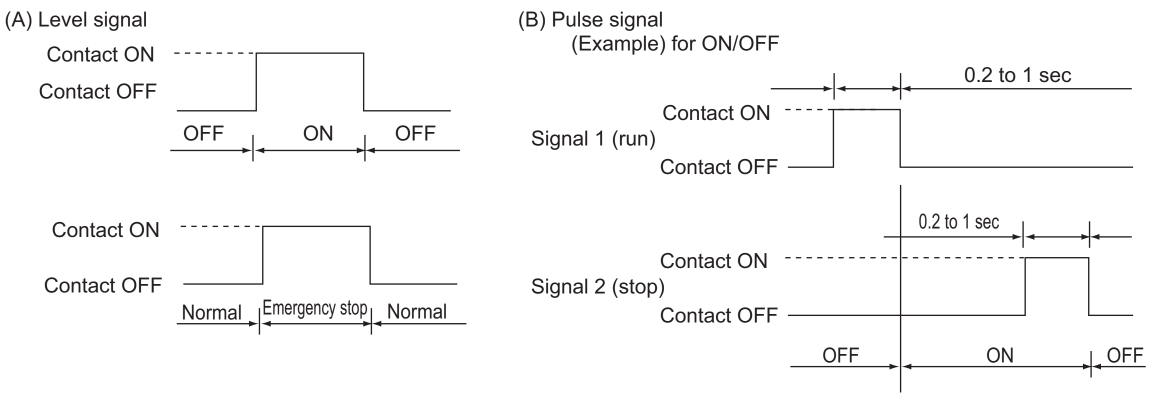
✻ External signal input requires the external I/O adapter (Model: PAC-YT51HAA-J) sold separately.

1). External input

External no-voltage contact signal can be used to send signals indicating the following status of all air conditioning units that are controlled : Emergency stop/Normal, ON/OFF, and local remote controller operation Prohibit/Permit.
The above settings can be made using the external input setting on the Initial Setting screen accessed from the Service Menu screen.

No	External signal input function	Remarks
1	Do not use external input signal (factory setting)	――――――――――――――――
2	Execute emergency stop/normal with level signal	The local remote controller ON/OFF operations, and the controller ON/OFF operation and prohibit/enable change operations will be prohibited during emergency stop.
3	Perform ON/OFF with level signal	The local remote controller ON/OFF operations, and the controller ON/OFF operations and prohibit/enable change operations will be prohibited.
4	Perform ON/OFF, prohibit/enable with pulse signals.	Set the pulse width while the contact is ON to 0.2 to 1 sec.

2). Level signal and pulse signal



✻ The prohibit/enable input is the same.

3). External input specifications

CN2	Lead wire	Emergency stop/normal level signal	ON/OFF, level signal	ON/OFF, prohibit/enable pulse signal
No.1	Green	Built-in power supply for external input (DC5V)		
No.2	Yellow	Emergency stop/normal input	ON/OFF input	ON input
No.3	Orange	Not used	Not used	OFF input
No.4	Red	Not used	Not used	Local remote controller operation prohibit input
No.5	Brown	Not used	Not used	Local remote controller operation enable input

(A) For level signal

① When the emergency stop/normal signal is selected, the status will change from normal to emergency stop when the external input signal contact changes from OFF to ON, and will change from emergency stop to normal when the contact changes from ON to OFF. Emergency stop signal will bring the air conditioners to stop, and canceling the emergency stop will not automatically reset these units. To go back to the previous operation status, they must be manually turned back on.

② When the ON/OFF signal is selected, the status will change from OFF to ON when the external input signal contact changes from OFF to ON, and will change from ON to OFF when the contact changes from ON to OFF.

(B) For pulse signal

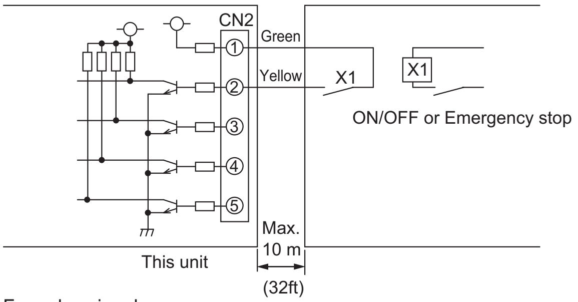
① Even if the ON signal is input during ON, the status will remain ON.

② If local remote controller operation is prohibited, ON/OFF, operation mode, set temperature, filter sign reset, fan speed, and air direction settings will be prohibited, and also timer (schedule) settings from the local remote controllers will be deactivated. Depending on the models of the connected air conditioning units and remote controllers, operation of some of the items above may not be disabled.

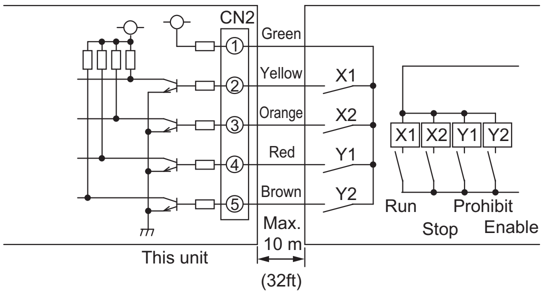
③ Set the pulse width (contact ON time) to 0.2 to 1 sec.

4). Recommended circuit example

(A) For level signal



(B) For pulse signal



① The relays and extension cables, etc. must be prepared separately at the site.
② Use a no-voltage contact and minute load relay (minimum application load 5VDC-1mA).
③ The length of the connection cable extension should not exceed 10 m (32 ft). (Use a cable of 0.3 mm^2 (22 AWG) or thicker.)
④ Cut of the cable not being used close the connector and properly insulate the cut off ends with tape or the like.

(2). External signal output function

❇ External signal output requires the external I/o adapter (Model: PAC-YT51HAA-J) sold separately.

1). External output

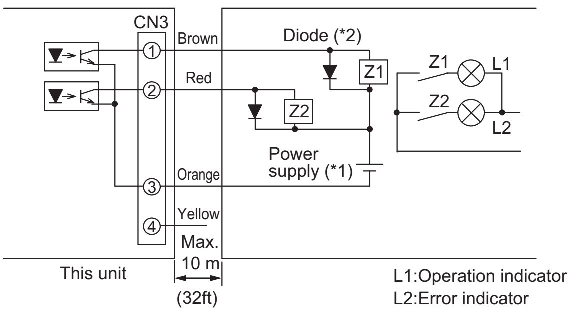
When one or more air conditioners are running, the “ON” signal will be output and if a malfunction occurs in one or more air conditioners, the “Malfunction” signal will be shown.

2). External output specifications

CN 3	Lead wire	Details of each terminal
No.1	Brown	ON/OFF
No.2	Red	Malfunction/normal
No.3	Orange	Common (External ground)
No.4	Yellow	

① " ON" signal and " Malfunction" signal will both be output.

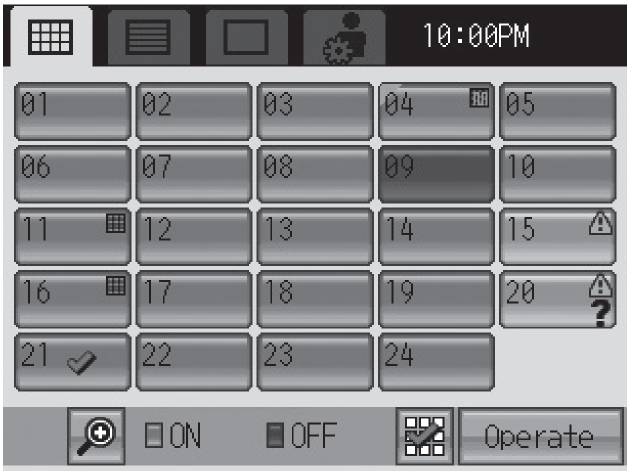
3). Recommended circuit example



Use Z1 and Z2 relays having the following specifications.
Operation coil
Rated voltage :12VDC,24VDC
Power Consumption : 0.9W or less
(*1)Prepare a power supply separately according to the relay being used. (12VDC or 24VDC)
(*2)Always insert a diode on both ends of the relay coil.

① Each element will turn on while ON operation or a malfunction occurs.
② The connection cable can be extended up to 10m (32ft).
③ The relays, lamps, diodes and extension cables, etc, must be prepared separately at the site.

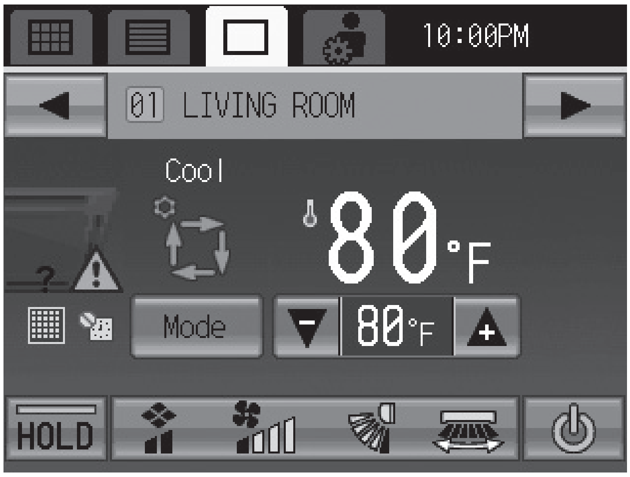
3. Screens of TC-24B



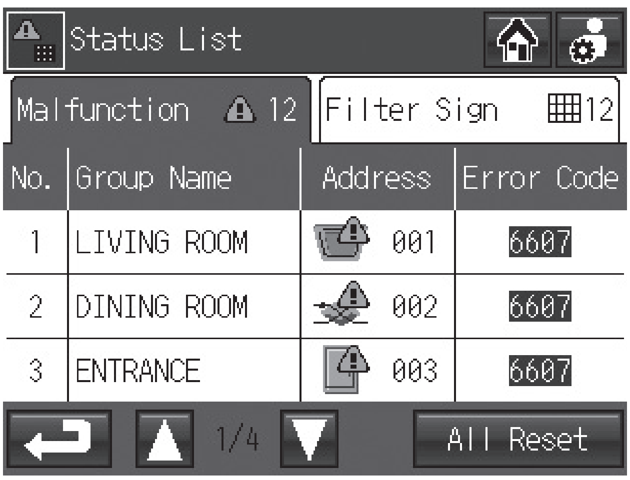
GRID (S)

GRID (L)

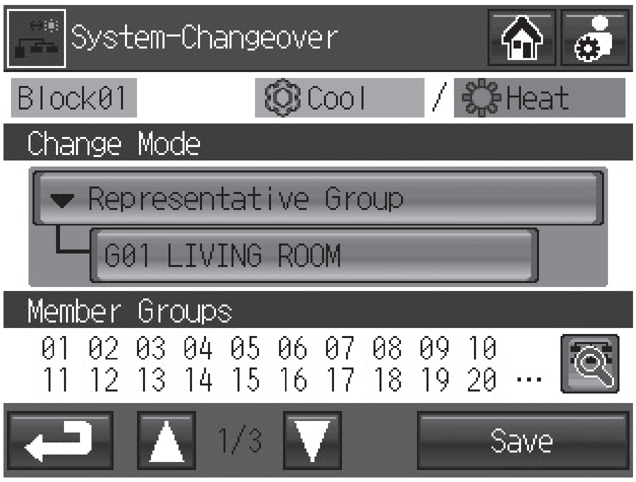
LIST



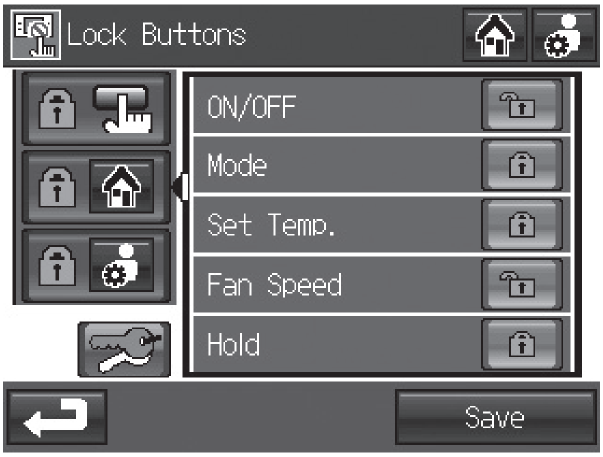
GROUP



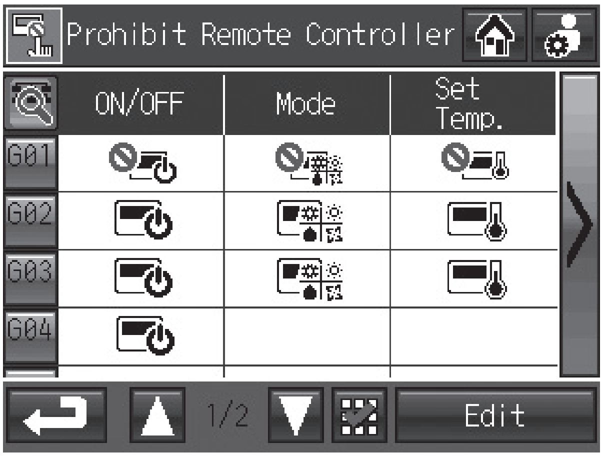
Status List



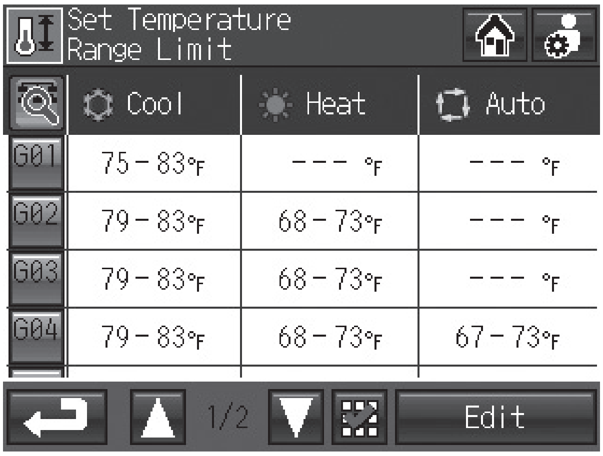
System-Changeover



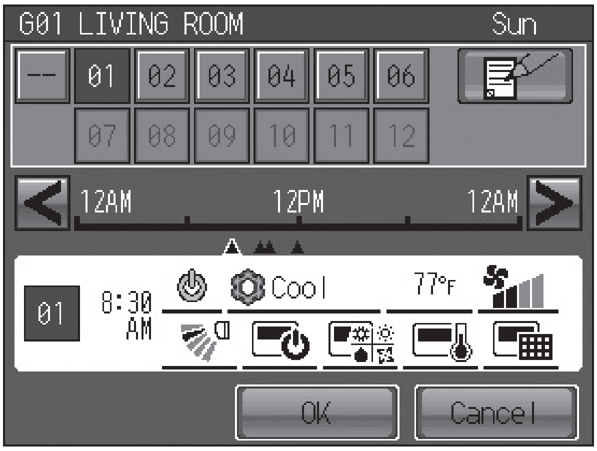
Operation Lock



Prohibit Remote Controller



Set Temperature Range Limit

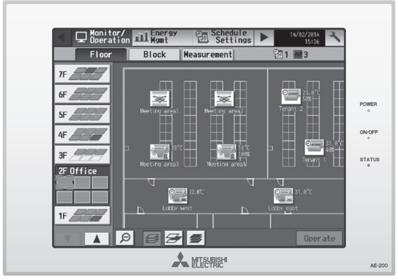


Set Schedule

Display Format

CONTROLLER

3-3. Centralized controller [AE-200A/AE-50A]



Dual Set Point

A. The use of AE-200A/AE-50A combined with AHC will allow the use of external signal, making it possible to use integrated control of air conditioning systems including third-party HVAC products.

B. The centralized controller of AE-200A combines Web function, which enable the air conditioner system management on a PC browser screen. *1
The management even carried out at a long distance place via public telephone line or internet.

*1 Microsoft® Internet Explorer 11.0
Microsoft® Edge
Safari 7
Google Chrome™

C. Together with PI or DIDO controller, many optional functions like "Charging", "Peak-cut", "Energy saving", "General equipment management", "Scheduling" etc, can be carried out.
Details, please refer to sections of PI and/or DIDO controller.

D. One AE-200A can control maximum 50 units (including Lossnay). Up to 200 units (including Lossnay) can be controlled from one AE-200A connected with four expansion controllers (AE-50A/EW-50A).
Up to four expansion controllers can be connected to one AE-200A with Ver.7.2 or later. When four expansion controllers are connected, the air conditioning units cannot be connected to AE-200A.

E. Taking advantage of AE-200A's Web functions, alarming E-mail containing address and error code can be sent to appointed E-mail address upon any fault happen at the air conditioner system.
This could release standby personnel and save operation cost.

F. AE-200A/AE-50A features a 10.4 color LCD touch panel. The settings for air conditioning units can be changed by touching the corresponding icons on the display.

G. The interlock-control option enables interlocked operations of air conditioning unit groups and the general equipment groups, based on the changes of status in the ON/OFF, Mode, or Error signals.(Can be set from the Web browser only)

■ Functions

□:Each unit ○:Each group ●:Each block
△:Each floor ◎:Collective ×:Not available

Item	Description	Operations	Display
ON/OFF	ON and OFF operation for the air conditioner units	○◎△●	○◎
Operation mode switching	Switches between several operation modes depending on the air conditioning unit. Air conditioning unit: Cool/Dry/Auto(*)/Fan/Heat/Setback Lossnay unit: Heat Recovery/Bypass/Auto Air To Water (PWFY) units: Heating, Heating ECO, Hot Water, Anti-freeze, Cooling *Auto mode is for CITY MULTI R2- and WR2-Series only.	○◎△●	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○◎△●	○
Sliding Temperature setting	This function shifts the preset temperature by the preset increment to reduce the temperature difference between the indoor and outdoor air temperatures during cooling operation. The maximum shifting temperature (±1°C, ±2°C, ±3°C, ±4°C) can be set for each group.	○	○
Night setback setting	This function helps keep the indoor temperature in the temperature range while the units are stopped and during the time this function is effective.	○	○
Fan speed setting	Models with 5 air flow speed settings: Hi/Mid-1/Mid-2/Low, Auto Models with 4 air flow speed settings: Hi/Mid/Low, Auto Models with 2 air flow speed settings: Hi/Low Fan speed setting (including Auto) varies depending on the model.	○◎△●	○
Air flow direction setting	Air flow direction angles, 4-angle or 5-angle Swing, Auto *1: Louver cannot be set. ※Air flow direction settings vary depending on the model.	*1 ○◎△●	○
Schedule operation	Annual/Weekly (5 types)/Today schedule can be set for each group of air conditioning units. Optimized start setting is also available. *2: The system follows either the current day, annual schedule, or weekly, which are in the descending order of overriding priority. Twenty-four events can scheduled per day, including ON/OFF, Mode, Temperature Setting, Vane Direction, Fan Speed, and Operation Prohibition. Five types of weekly schedule(Summer/Winter/etc.) can be set. Settable items depend on the functions that a given air conditioning unit supports.	*2 ○◎△●	○
Permit/Prohibit local operation	Individually prohibit operation of each local remote control function (ON/OFF, Change operation mode, Set temperature, Reset filter). Air Direction, Fan speed, Timer *3: The settable items vary depending on the models.	○◎△●	○ *3
Hold	When Hold function is enabled, the scheduled operations are disabled. The operations that have been scheduled from the remote controller/sub system controller will also be disabled. * Hold function vary depending on model. * The Hold function cannot be enabled on general equipments.	○●◎	○
Indoor unit intake temperature	Measures the intake temperature of the indoor unit. *8: Displays the ambient temperature of either the return air temperature sensor on the indoor unit or the temperature sensor on the remote controller, whichever is selected on the indoor temperature display mode selection.	×	○ *8
Error	When an error is occurring on an air conditioner unit, the affected unit and the error code are displayed. *4: When an error occurs, the "ON/OFF" LED flashes. The operation monitor screen shows the abnormal unit by flashing it. The error monitor screen shows the abnormal unit address, error code and source of detection. The error log monitor screen shows the time and date, the abnormal unit address, error code and source of detection.	×	*4 □◎
Test run	This operates air conditioner units in test run mode.	○◎△●	○
Ventilation equipment	The interlocked system settings can be performed by the master system controller. When setting the interlocked system, you can use the ventilation switch to switch the free plan Lossnay settings between "Hi", "Low" and "Stop". When setting a group of only free plan Lossnay units, you can switch between "Normal ventilation", "Interchange ventilation" and "Automatic ventilation". *5 When setting ventilation interlock with Mr.Slim units, the air conditioning and interlocked ventilation icon will display ON even when the interlocked Lossnay is operating by itself. (This will occur when used with the following M-NET adapter: PAC-SF48/50/60/70/80/81MA-E)	○◎△●	○ *5
External input/output	By using accessory cables you can set and monitor the following: Input: By level signal: "Batch ON/OFF", "Batch emergency stop" By pulse signal: "Batch ON/OFF", "Enable/disable local remote controller" Output: "ON/OFF", "Error/Normal" *6: Requires an external I/O cable (PAC-YG10HA-E; sold separately) and a commercially available external power supply.	◎ *6	◎ *6
Temp range limit settings	Sets the temperature range for the local remote controllers. *7: The item and range that can be operated or monitored depend on the function of the indoor unit.	○ *7	○
AHC status	Displays the status of input and output ports of each Advanced HVAC CONTROLLER (AHC).	×	□
Free Contact status	Displays the input/output status of the free contacts on the indoor units.	×	□
Measurement	Displays the temperature, humidity, and the reading of the watt-hour meter.	×	□
Outdoor Unit Status Monitor	Monitor the current outdoor unit status Data: Frequency (Compressor), high/low pressure (outdoor unit)	×	□
Energy Use Status	On the Energy Use Status screen, the energy-control-related status, such as electric energy consumption, operation time, and outdoor temperature, can be displayed in a graph. Operators can check the detailed status of given indoor units by specifying the date to display the data per group, block, or unit address.	×	□○●
Filter sign reset/ Filter sign	Filter sign can be reset for each group or block of indoor units. Filter sign indicates that the filter on the units in a given group is due for cleaning.	□○●	□○●
Interlock setting	Operation of indoor groups or general equipment can be interlocked by the change of state (ON/OFF, mode, error of indoor groups and general equipment). (AE-200A/AE-50A will execute interlocking control depending on the interlocked setting.)	○	○
Data back-up (PC) or USB memory	The initial setting data, operation data (charge parameter, power consumption data) can be stored in the PC, or USB memory.	◎	–
Apportioned electricity charge function	The amount of power consumed by the air conditioners is calculated with the use of AE-200A with Ver.7.2 or later. The calculated data can be output to the PC via USB memory or LAN, and the charge report can be created with the use of the designated charge calculation tool.	○	○
BACnet® connection	CITY MULTI can easily combine into a Building Management System (BMS) via the BACnet® and M-NET adapter BAC-HD150.	○	–
Integrated control	A maximum of 40 units of AE-200A, AE-50A, and EW-50A combined can integrally be controlled from a PC, a tablet PC, or a smartphone, allowing for the controlling and monitoring of the air-conditioning units connected to it.	○●△◎	○●△◎

NOTE: Depending on the versions of AE-200A, some of the functions may not be available.

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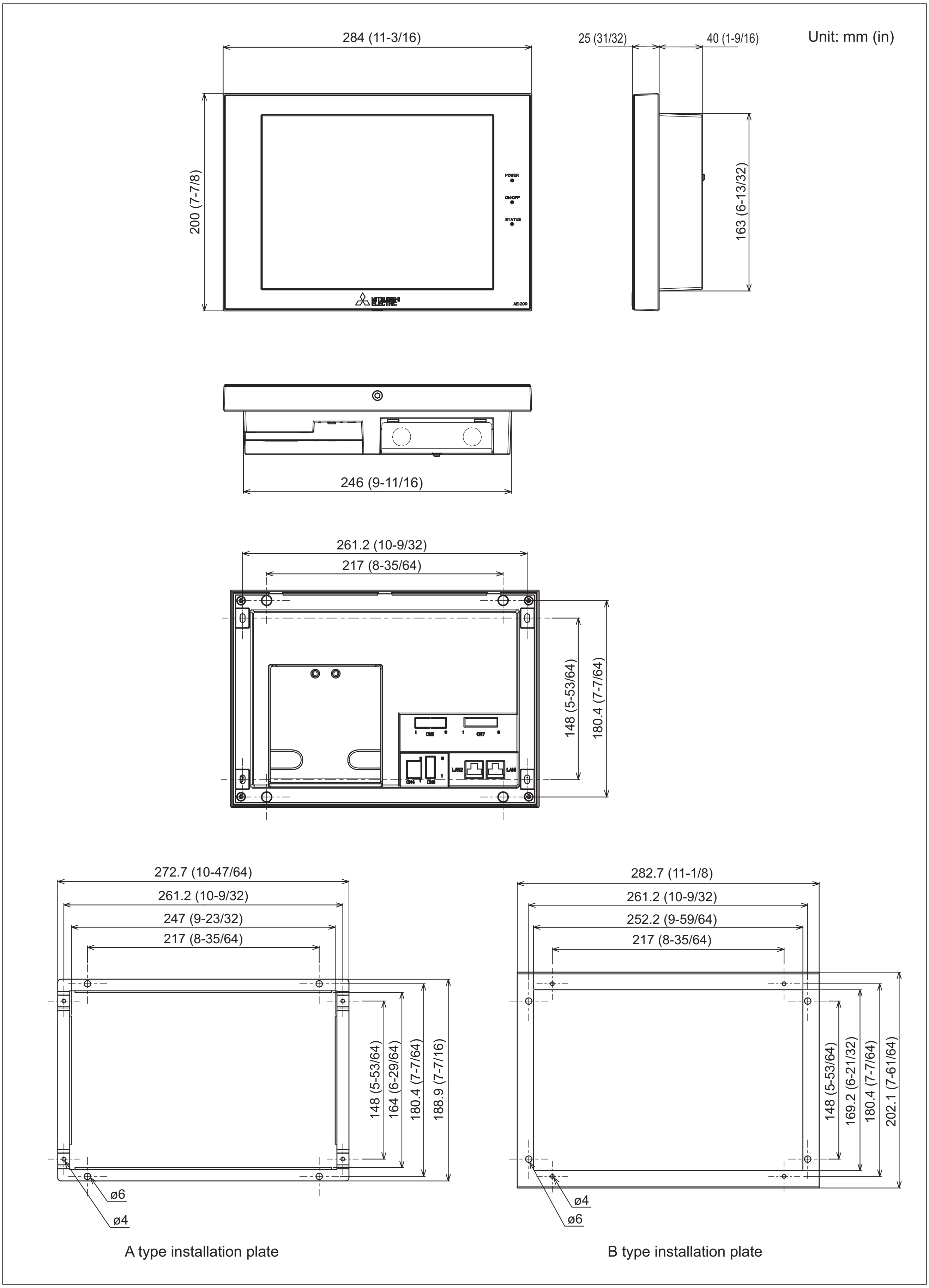
■ External dimension



1. Power supply to AE-200A

AE-200A needs AC power (100-240VAC) and M-NET; the former is for centralized control transmission use and the latter is for AE-200A's operating and LAN function use.
Except when the sub system controller is used, the power supply unit PAC-SC51KUA or the power supply from the outdoor unit to M-NET is not necessary. For more details, please refer to the Installation Manual of AE-200A/AE-50A.

(1). The basic scheme is as follows.

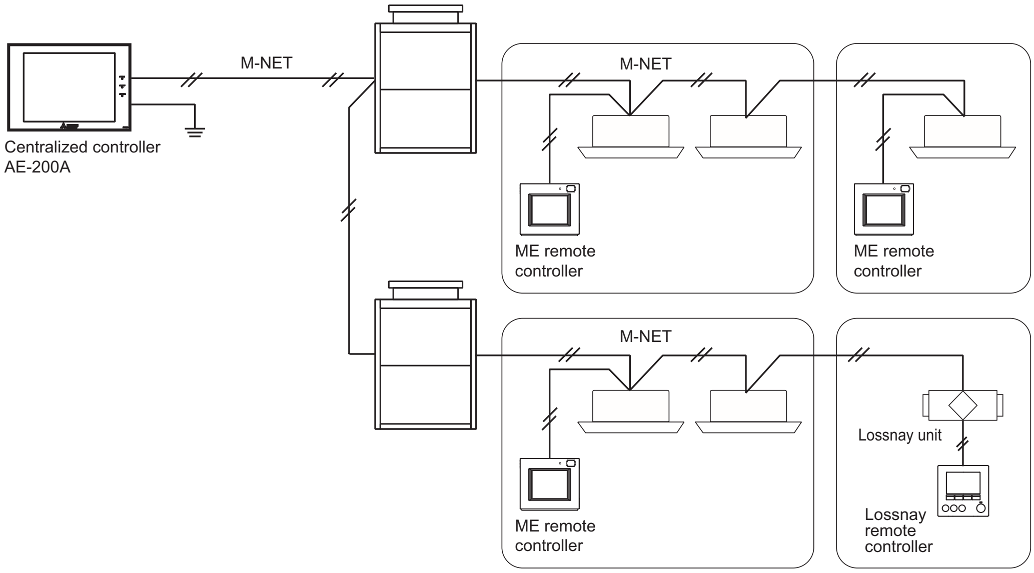


Fig.1 AE-200A basic scheme.

2. M-NET power supply

AE-200A/AE-50A has a built-in function to supply power to the M-NET transmission line.

The amount of power that an AE-200A or an AE-50A can supply is equivalent to the power required by an MN converter (CMS-MNG-E) that is used for maintenance.

Note	
	・Supplying power from the outdoor unit or the power supply unit, it is necessary to disconnect the M-NET power jumper CN21. (At factory setting, CN21 is connected.) ・When connecting both AE-200A/AE-50A and the system controller (Advanced touch controller, ON/OFF remote controller, etc.) to the same M-NET system, it is necessary to connect the power supply unit (PAC-SC51KUA), and disconnect the M-NET power jumper CN21 on AE-200A/AE-50A. ・**When connecting both AE-200A/AE-50A and BAC-HD150 (BM ADAPTER) to the same M-NET system, certain restrictions apply. Consult your dealer for details.**

3. External input/output usage

✻ To use the external signal input, an external I/O adapter (PAC-YG10HA-E; sold separately) and an external power supply are required.

NOTE: When using AE-50A/EW-50A, connect the external input/output adapter to each AE-200A/AE-50A/EW-50A.
(External input signal to AE-200A cannot perform the collective operations (e.g., emergency stop) for AE-50A/EW-50A systems.)

[External signal input function]

Using external contact signals (12 or 24 VDC), the following collective operations for all connected air conditioning units can be controlled: Emergency stop, ON/OFF operation, and Prohibit/Permit local remote controller operation.

(1) External signal input function setting

Setting mode	Description
[Demand (Level signal)/Not in use] (Factory setting)	Select this mode when inputting a demand level using a level signal, or when not using an external signal input function. A demand signal of four different levels will be input.
[Emergency Stop (Level signal)]	Using a level signal, all the air conditioning units connected to the AE-200A or AE-50A /EW-50A will be stopped collectively in an emergency. During an emergency stop, the ON/OFF operation from the local remote controllers will be prohibited, and the ON/OFF operation and Prohibit/Permit settings on the AE-200A or AE-50A/EW-50A will be prohibited. A demand signal of three different levels will be input.
[ON/OFF (Level signal)]	Using a level signal, all the air conditioning units connected to the AE-200A or AE-50A /EW-50A will be run or stopped collectively. The ON/OFF operation from the local remote controllers will be prohibited, and the ON/OFF operation and Prohibit/Permit settings on the AE-200A or AE-50A/EW-50A will be prohibited. Scheduled operations will not be performed.
[ON/OFF/Prohibit/Permit (Pulse signal)]	Using a pulse signal, all the air conditioning units connected to the AE-200A or AE-50A /EW-50A will be run or stopped collectively, or the operation from the local remote controllers will be prohibited or permitted collectively.

* General equipment connected via a DIDO controller (PAC-YG66DCA) cannot be collectively run or stopped by using the external signal input function unless [Emergency Stop (Level signal)] is selected and relevant switches on the DIDO controller are set.
* The external input function cannot be used on HWHP (CAHV) units.

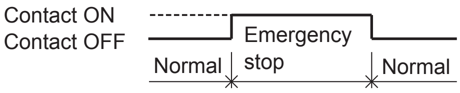
(2) External signal input specifications

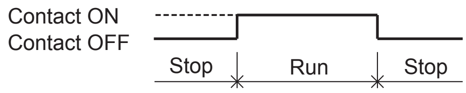
CN5	Lead wire from PAC-YG10HA-E	Demand (Level signal)	Emergency Stop (Level signal)	ON/OFF (Level signal)	ON/OFF/Prohibit/Permit (Pulse signal)
No. 5	Orange	Demand level 1	Emergency stop signal, Normal operation signal	ON signal, OFF signal	ON signal
No. 6	Yellow	Demand level 2	Demand level 2	–	OFF signal
No. 7	Blue	Demand level 3	Demand level 3	–	Prohibit signal
No. 8	Gray	Demand level 4	Demand level 4	–	Permit signal
No. 9	Red	External power supply (+12 or +24 VDC)			

CONTROLLER

(3) Level signal and pulse signal

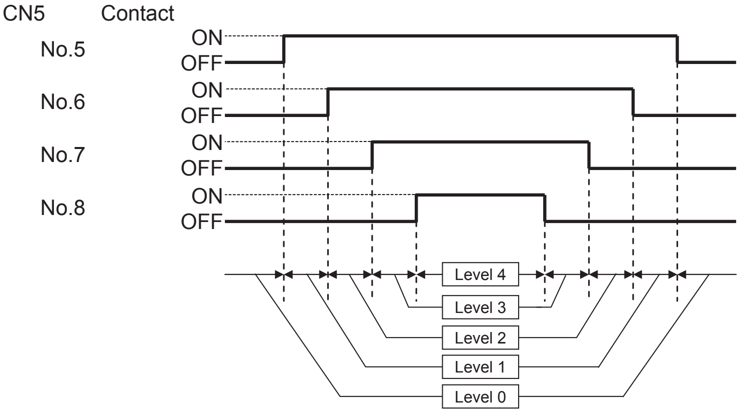
(A) Level signal



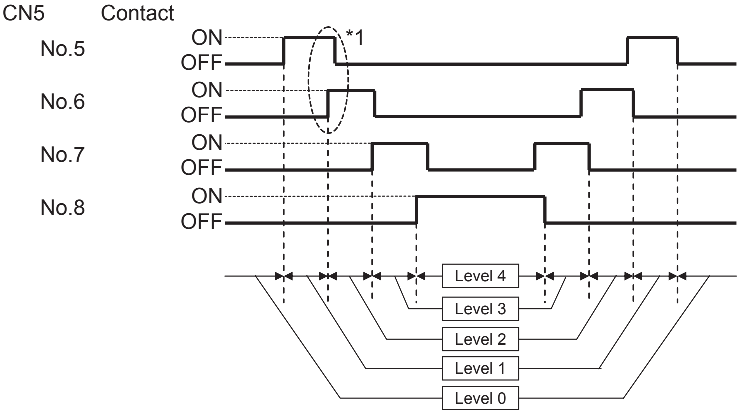


How the demand level is determined

Demand level signal specification: When higher levels’ contacts turn on, lower levels’ contacts also stay on.



Demand level signal specification: Only the current levels’ contacts turn on.

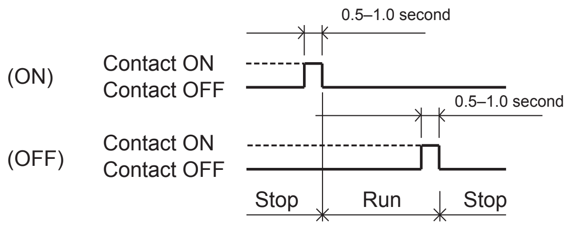


*1 The specification must be followed in the following order: ① When the level changes, the contact of the level after the change turns on.; ② The contact of the level before the change turns off.

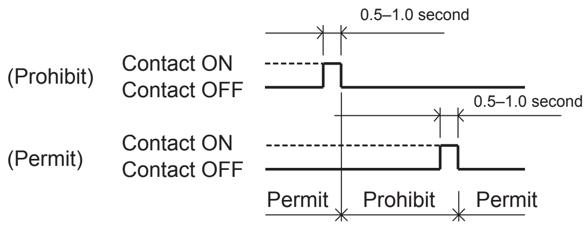
1. If [Emergency stop (Level signal)] is selected, the air conditioning units in normal operation will stop when the contact turns on. Even when the contact turns off, these units will remain stopped. They must be started up manually after the emergency stop is reset.
2. If [ON/OFF (Level signal)] is selected, the air conditioning units that are stopped will start operation when the contact turns on. Conversely, the units that are in operation will stop when the contact turns off.
3. Demand control is performed when the demand level contact turns on. If two different demand levels' contacts turn on at the same time, the demand control will be performed with the higher level demand.
   (Even if the demand control is not performed due to unexpected problems, Mitsubishi Electric will not be responsible for exceeding the maximum power demand.)

(B) Pulse signal

(Example) ON/OFF



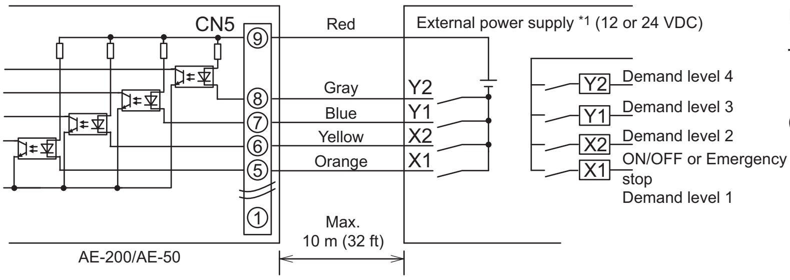
(Example) Prohibit/Permit



1. If the input pulse signal is the same as the current operation status of the air conditioning units, no status change will occur. (For example, if an ON signal is input while the air conditioning units are in operation, the units will continue their operation.)
2. If the operation from the local remote controller is prohibited, ON/OFF status, operation mode, or temperature setting cannot be changed and filter sign cannot be reset from the local remote controller.
3. The pulse width (contact ON) should be between 0.5 and 1.0 second.

(4) Recommended circuit

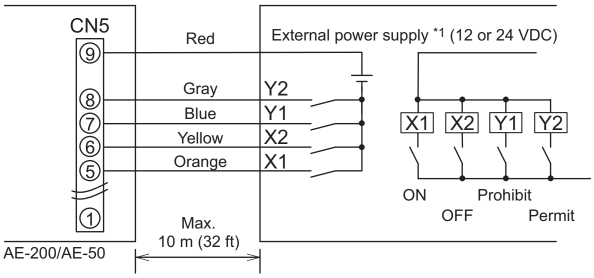
(A) Level signal



Use relays X1, X2, Y1, and Y2 that meet the following specifications.

Contact rating
Rated voltage: 12 VDC or above
Rated current: 0.1 A or above
Minimum applied load: DC 1 mA

(B) Pulse signal



*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
Connect the external power supply in the correct polarity to input and output the signals.
Connect ⑤–⑧ (see the figure at left) to the negative side.

Important

- **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.**
- **Connect the external power supply in the correct polarity to avoid malfunctions.**

Note

- The relays, external power supply, and extension cables are not supplied.
- The total length of the lead wire and extension cable should not exceed 10 m (32 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Cut the excess cable near the connector, and insulate the end of the unused cable with tape.

[Pulse signal input function]

Using pulse signals directly input from metering device such as watt-hour meter, billing data and energy management data will be obtained based on the cumulative number of pulse signal input.

Note
- To input pulse signals directly from the metering device to the AE-200A/AE-50A, use the connector connected to the AE-200A/AE-50A. (Aprecision screwdriver for M1 screws is required.).

Usability of a built-in PI controller for each function

Function	AE-200A	AE-50A	EW-50A
Apportioned electricity billing function (option)	x*1	V*2	V*2
Energy management	V	V	V
Demand function (option)	V	V	V

(V): Usable, (x): Not usable

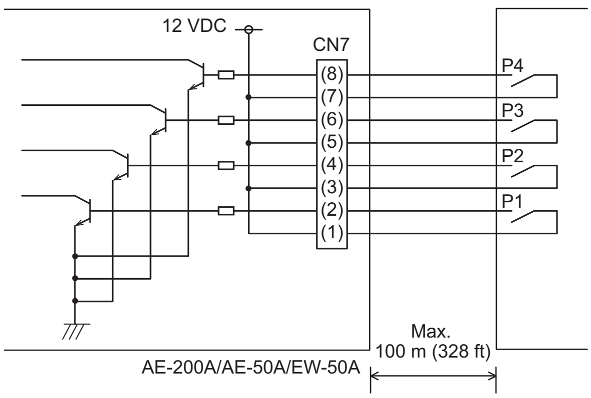
*1 A built-in PI controller on the AE-200A cannot be used for an apportioned electricity billing function. Use a built-in PI controller on the AE-50A or EW-50A.

*2 Using a PI controller (PAC-YG60MCA) is recommended instead of a built-in PI controller on the AE-50A/EW-50A when using an apportioned electricity billing function. (Discrepancies may occur between the built-in PI controller reading and the actual electric energy because the pulse input cannot be obtained during the AE-50A/EW-50A power failure, shutoff process, and software update.)

(1) Pulse signal input specifications

CN7	Signal
No. 7, 8	Metering device 4 (count input)
No. 5, 6	Metering device 3 (count input)
No. 3, 4	Metering device 2 (count input)
No. 1, 2	Metering device 1 (count input)

(2) Recommended circuit



A voltage of 12 VDC is applied to CN7. Do not apply a power voltage from any other power source.

Contact rating
Rated voltage: 12 VDC
Rated current: 0.1 A or above
Minimum applied load: DC 1 mA

Note
- The total length of the lead wire and extension cable should not exceed 100 m (328 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Cut the excess cable near the connector, and insulate the end of the unused cable with tape.
- Do not run the signal input cable adjacent to the M-NET transmission and power cables. Do not let the cable form a loop.
- Peel off the sheath to 6 ±1 mm (4/16 ±1/16 in) from the end, and securely insert the cable into the terminal.
- Leave adequate slack in the cables so that the weight of them will not strain the terminal connectors. Use cable clamps or trunk terminals as necessary.

[External signal output function]

An ON signal is output when one or more units are in operation, and an Error signal is output when one or more units are in error.

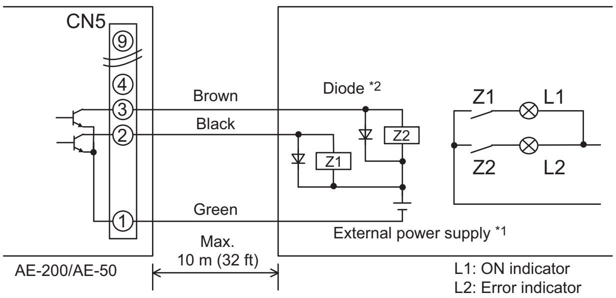
(1) External signal output specifications

CN5	Lead wire from PAC-YG10HA-E	Signal
No. 1	Green	Common ground for external output (Ground for the external power supply)
No. 2	Black	ON signal*, OFF signal
No. 3	Brown	Error signal, Normal signal

* The operation status of general equipment (via a DIDO controller (PAC-YG66DCA)) will not be output.
* The ON signal will be output even during an error.

(2) Recommended circuit

Relay-driven circuit



Use relays Z1 and Z2 that meet the following specifications.

Operation coil
Rated voltage: 12 or 24 VDC
Power consumption: Max. 0.9 W

*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
Connect the external power supply in the correct polarity to input and output the signals.
Connect ① (shown in the figure at left) to the negative side.
*2 Use a diode at both ends of the relay coils.

Important

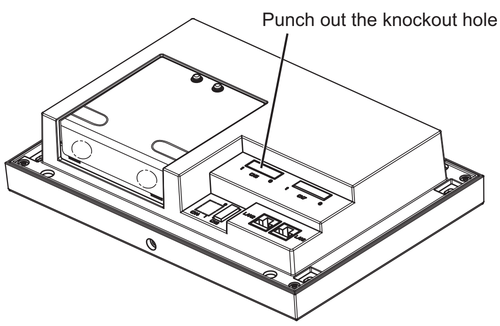
- **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.**
- **Connect the external power supply in the correct polarity to avoid malfunctions.**
- **Do not connect the external power supply without relays being connected to the controller (no load).**

Note

- The relays, lamps, external power supply, diodes, and extension cables are not supplied.
- The total length of the lead wire and extension cable should not exceed 10 m (32 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Each element will turn on during operation and when an error occurs.

Note

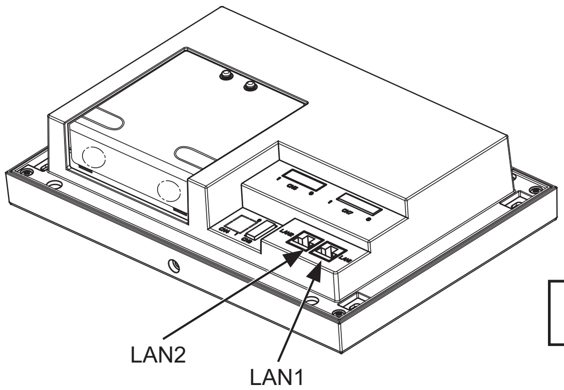
* When connecting the external input/output cables to connector CN5 on the controller, punch out the knockout hole.

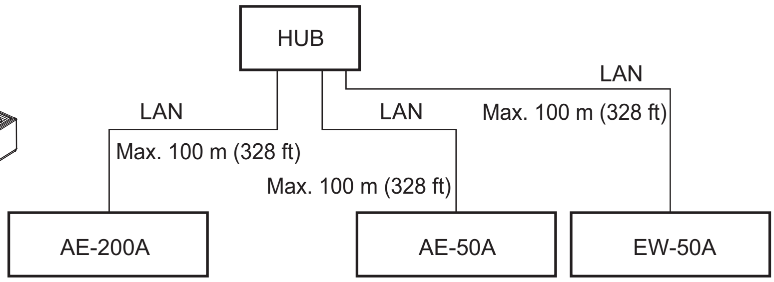


4. Connecting the LAN cable

Connect the LAN cable to the LAN1 port on the AE-200A/AE-50A/EW-50A. (The LAN2 port is unused.)

- The LAN cable is not supplied. Use a category 5 or above straight LAN cable.
- Use a switching HUB.
- The maximum distance between the switching HUB and AE-200A/AE-50A/EW-50A is 100 m (328 ft).
- The recommended number of connected devices such as gateway, router, layer 3 switch, or HUB between the AE-200A and AE-50A/EW-50A is four or less.



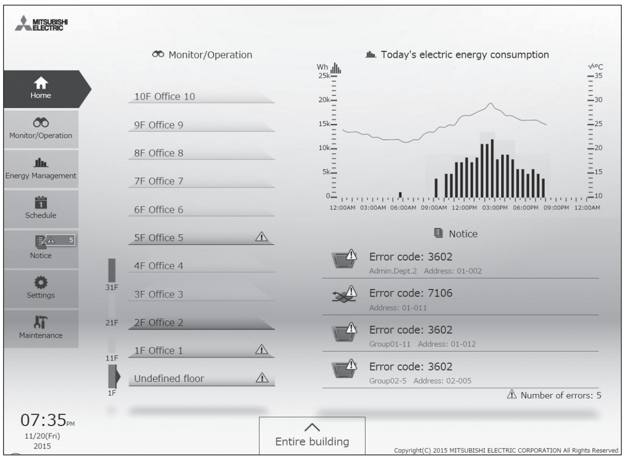


Note

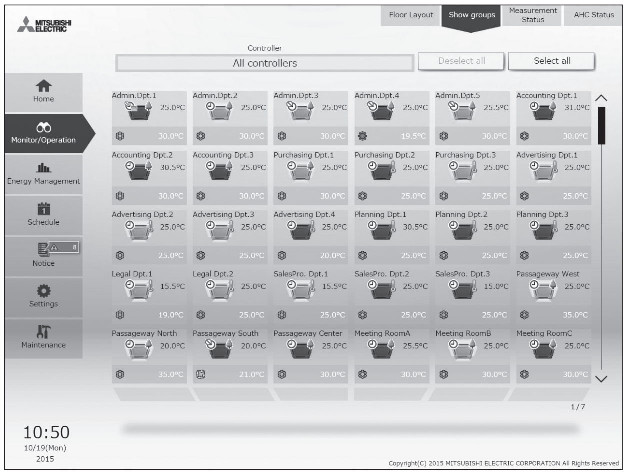
- LAN must be installed before the unit installation. Route the LAN cable to the AE-200A/AE-50A/EW-50A in the same way as the M-NET transmission cables.
- When connecting the AE-200A/AE-50A/EW-50A to an existing LAN, consult the system administrator to decide the IP address. Change the IP address setting before connecting the LAN cable to the LAN1 port.
- To prevent unauthorized access, always use a security device such as a VPN router when connecting the AE-200A/AE-50A/EW-50A to the Internet.

5. Browser screens of AE-200A/AE-50A

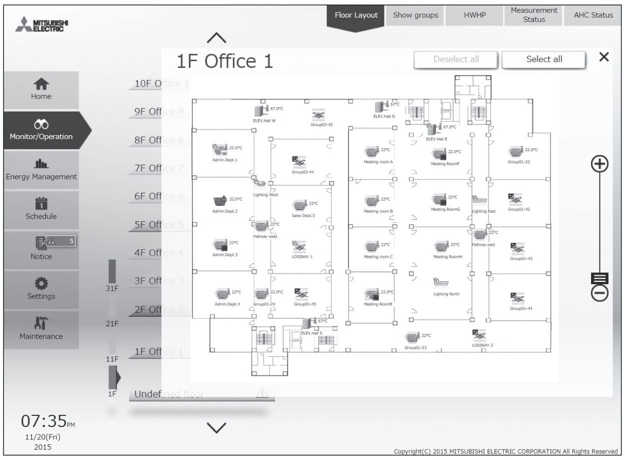
(1) PC, Tablet device



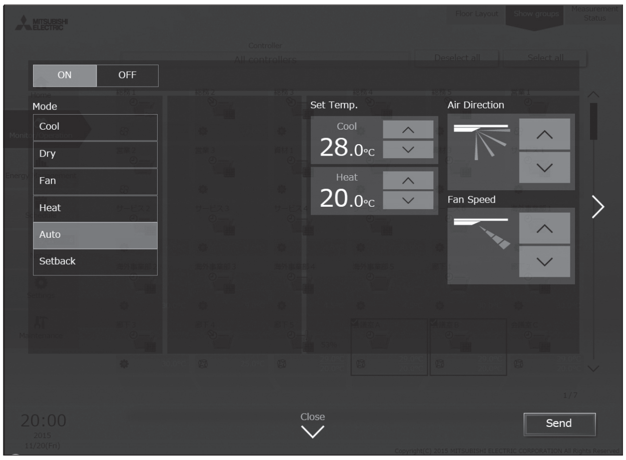
Home



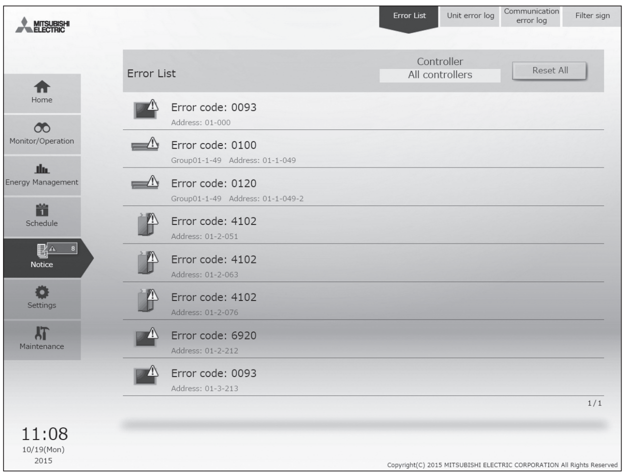
Monitor (Show Groups)



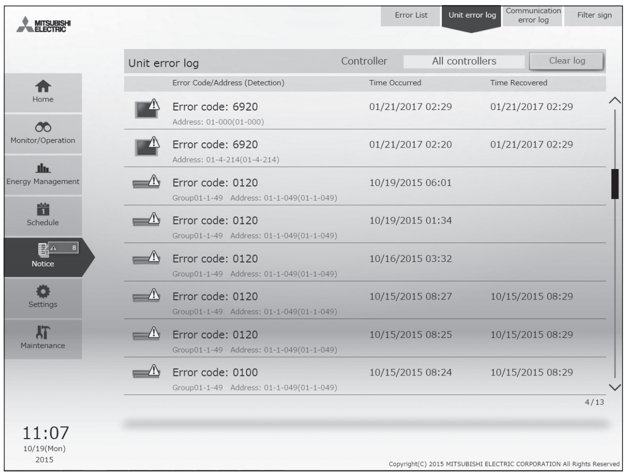
Monitor (Floor Layout)



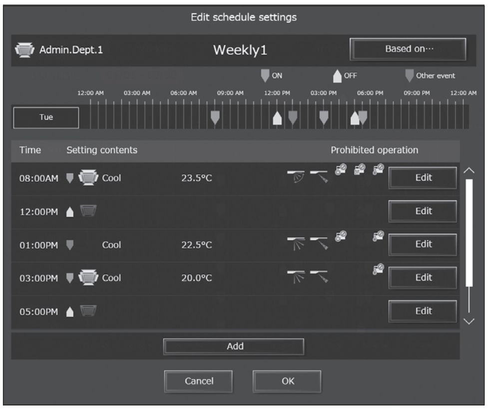
Operation



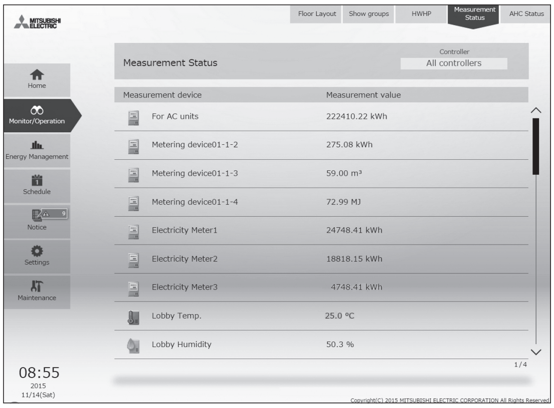
Error List



Unit Error Log

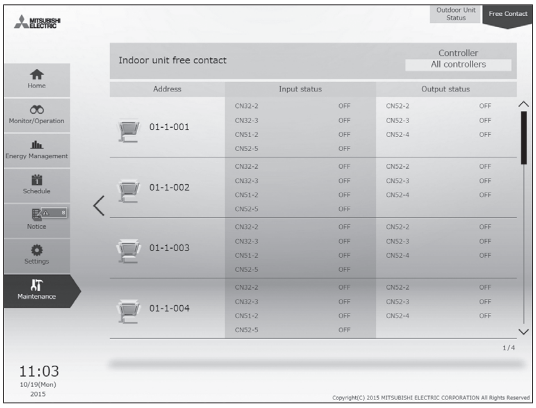


Weekly Schedule 1



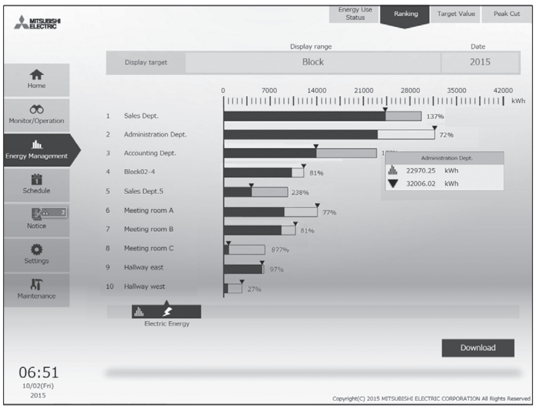
Measurement Status Monitor (Temperature Sensor/Humidity Sensor /Measurement Meter)

Advanced HVAC CONTROLLER Status Monitor



Free Contact Status Monitor

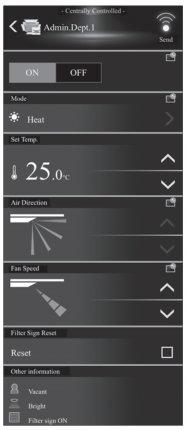
Energy Management Monitor (Energy Use Status)



Energy Management Monitor (Ranking)

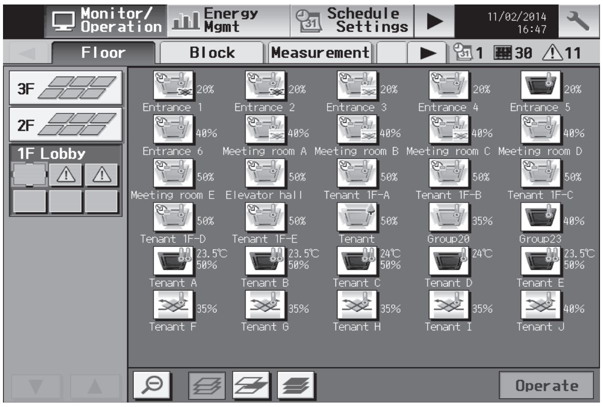
(2) Smart phone

Monitor (Show Groups)

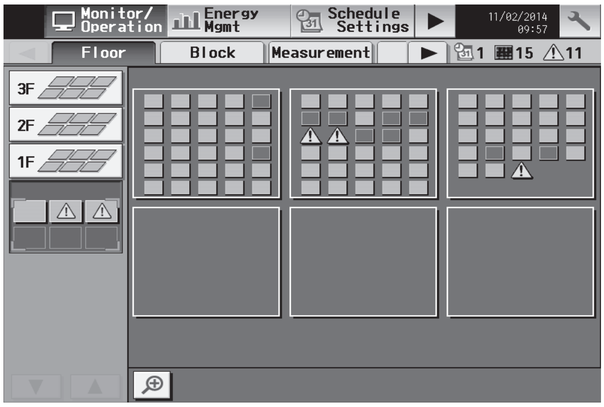


Operation

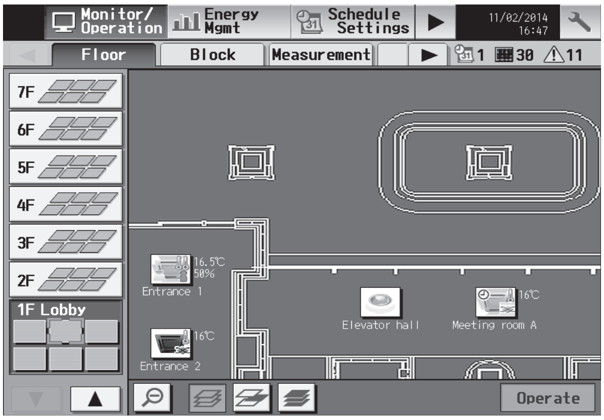
6. Liquid crystal displays of AE-200A/AE-50A



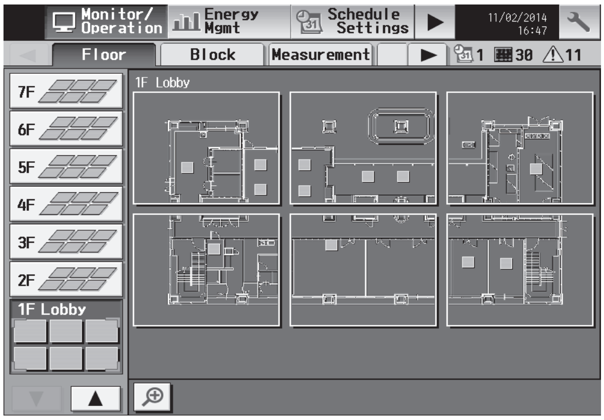
Floor Screen



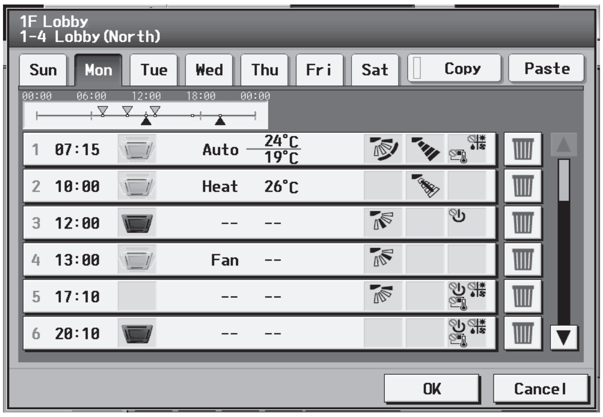
Floor Screen (Zoom-Out Display)



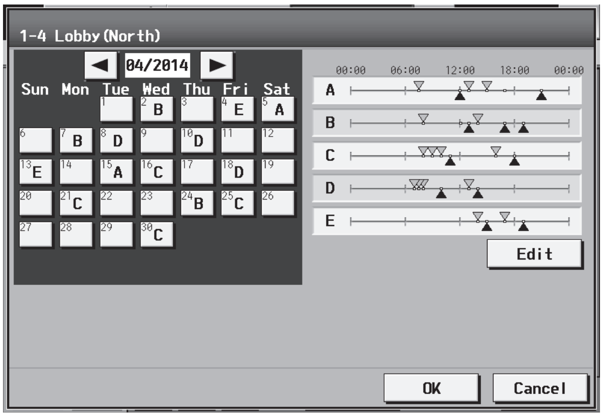
Floor Layout Screen



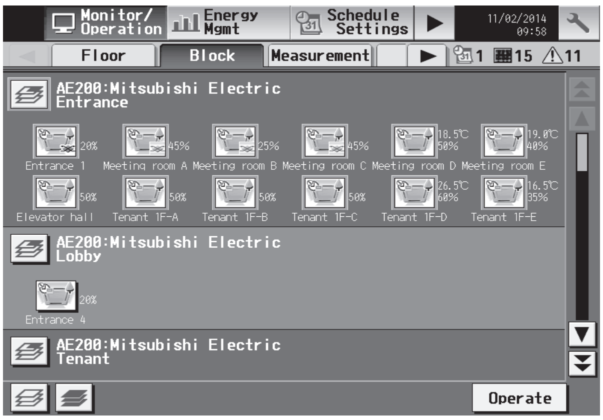
Floor Layout Screen (Zoom-Out Display)



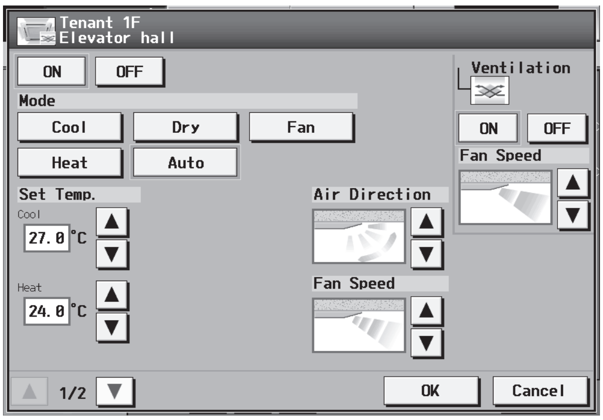
Weekly Schedule Setting Screen



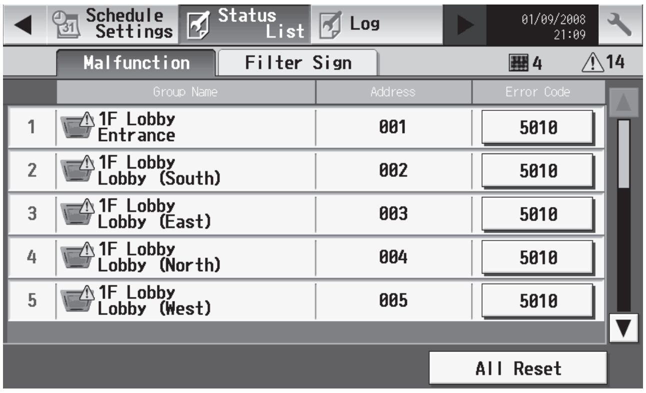
Annual Schedule Setting Screen



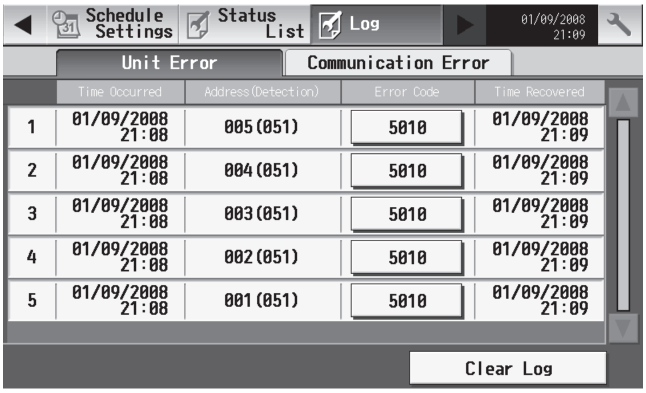
Block Display Screen



Operation Screen



Error Status Screen



Error History Display Screen

7. Option

Model	Description
PAC-YG84UTB-J	Electrical box for AE-200A wall-embed installations
PAC-YG10HA-E	External input/output adapter for AE-200A/AG-150A/PAC-YG50ECA
PAC-YG86TK-J	Mounting kit for AE-200A/AE-50A installations inside the control panel
PAC-YG82UTB-J	Mounting attachment for AE-200A wall surface installations

3-4. Centralized controller [EW-50A]

Dual Set Point

A. The use of EW-50A combined with AHC will allow the use of external signal, making it possible to use integrated control of air conditioning systems including third-party HVAC products.

B. The centralized controller of EW-50A combines Web function, which enable the air conditioner system management on a PC browser screen. *1
The management even carried out at a long distance place via public telephone line or internet.

*1 Microsoft® Internet Explorer 11.0
Microsoft® Edge
Safari 7
Google Chrome™

C. Together with PI or DIDO controller, many optional functions like "Charging", "Peak-cut", "Energy saving", "General equipment management", "Scheduling" etc, can be carried out.
Details, please refer to sections of PI and/or DIDO controller.

D. One EW-50A can control maximum 50 units (including Lossnay). Up to 200 units (including Lossnay) can be controlled from one AE-200A connected with four expansion controllers (AE-50A/EW-50A).
Up to four expansion controllers can be connected to one AE-200A with Ver.7.2 or later. When four expansion controllers are connected, the air conditioning units cannot be connected to AE-200A.

E. Taking advantage of AE-200A's Web functions, alarming E-mail containing address and error code can be sent to appointed E-mail address upon any fault happen at the air conditioner system.
This could release standby personnel and save operation cost.

F. The interlock-control option enables interlocked operations of air conditioning unit groups and the general equipment groups, based on the changes of status in the ON/OFF, Mode, or Error signals.(Can be set from the Web browser only)

■ Functions

□: Each unit ○: Each group ●: Each block
△: Each floor ◎: Collective ×: Not available

Item	Description	Operations	Display
ON/OFF	ON and OFF operation for the air conditioner units	○◎△●	○◎
Operation mode switching	Switches between Cool/Dry/Auto/Fan/Heat/Setback. (Group of Lossnay unit: automatic ventilation/vent-heat interchange/ normal ventilation) Operation modes vary depending on the air conditioner unit. Auto mode is the City Multi R2- and WR2-Series only.	○◎△●	○
Temperature setting	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.	○◎△●	○
Sliding Temperature setting	This function shifts the preset temperature by the preset increment to reduce the temperature difference between the indoor and outdoor air temperatures during cooling operation. The maximum shifting temperature (±1°C, ±2°C, ±3°C, ±4°C) can be set for each group.	○	○
Night setback setting	This function helps keep the indoor temperature in the temperature range while the units are stopped and during the time this function is effective.	○	○
Fan speed setting	Models with 5 air flow speed settings: Hi/Mid-1/Mid-2/Low, Auto Models with 4 air flow speed settings: Hi/Mid/Low, Auto Models with 2 air flow speed settings: Hi/Low Fan speed setting (including Auto) varies depending on the model.	○◎△●	○
Air flow direction setting	Air flow direction angles, 4-angle or 5-angle Swing, Auto *1: Louver cannot be set. *Air flow direction settings vary depending on the model.	*1 ○◎△●	○
Schedule operation	Annual/Weekly (5 types)/Today schedule can be set for each group of air conditioning units. Optimized start setting is also available. *2: The system follows either the current day, annual schedule, or weekly, which are in the descending order of overriding priority. Twenty-four events can scheduled per day, including ON/OFF, Mode, Temperature Setting, Vane Direction, Fan Speed, and Operation Prohibition. Five types of weekly schedule(Summer/ Winter/etc.) can be set. Settable items depend on the functions that a given air conditioning unit supports.	*2 ○◎△●	○
Permit/Prohibit local operation	Individually prohibit operation of each local remote control function (ON/OFF, Change operation mode, Set temperature, Reset filter). Air Direction, Fan speed, Timer *3: The settable items vary depending on the models.	○◎△●	○*3
Hold	When Hold function is enabled, the scheduled operations are disabled. The operations that have been scheduled from the remote controller/sub system controller will also be disabled. * Hold function vary depending on model. * The Hold function cannot be enabled on general equipments.	○●◎	○
Indoor unit intake temperature	Measures the intake temperature of the indoor unit. *8: Displays the ambient temperature of either the return air temperature sensor on the indoor unit or the temperature sensor on the remote controller, whichever is selected on the indoor temperature display mode selection.	×	○*8
Error	When an error is occurring on an air conditioner unit, the affected unit and the error code are displayed. *4: When an error occurs, the "ON/OFF" LED flashes. The operation monitor screen shows the abnormal unit by flashing it. The error monitor screen shows the abnormal unit address, error code and source of detection. The error log monitor screen shows the time and date, the abnormal unit address, error code and source of detection.	×	*4 □◎
Ventilation equipment	The interlocked system settings can be performed by the master system controller. When setting the interlocked system, you can use the ventilation switch to switch the free plan Lossnay settings between "Hi", "Low" and "Stop". When setting a group of only free plan Lossnay units, you can switch between "Normal ventilation", "Interchange ventilation" and "Automatic ventilation". *5 When setting ventilation interlock with Mr.Slim units, the air conditioning and interlocked ventilation icon will display ON even when the interlocked Lossnay is operating by itself. (This will occur when used with the following M-NET adapter: PAC-SF48/50/60/70/80/81MA-E)	○◎△●	○*5
External input/output	By using accessory cables you can set and monitor the following: Input: By level signal: "Batch ON/OFF", "Batch emergency stop" By pulse signal: "Batch ON/OFF", "Enable/disable local remote controller" Output: "ON/OFF", "Error/Normal" *6: Requires an external I/O cable (PAC-YG10HA-E; sold separately) and a commercially available external power supply.	◎*6	◎*6
Temp range limit settings	Sets the temperature range for the local remote controllers. *7: The item and range that can be operated or monitored depend on the function of the indoor unit.	○*7	○
AHC status	Displays the status of input and output ports of each Advanced HVAC CONTROLLER (AHC).	×	□
Free Contact status	Displays the input/output status of the free contacts on the indoor units.	×	□
Measurement	Displays the temperature, humidity, and the reading of the watt-hour meter.	×	□
Outdoor Unit Status Monitor	Monitor the current outdoor unit status Data: Frequency (Compressor), high/low pressure (outdoor unit)	×	□
Energy Use Status	On the Energy Use Status screen, the energy-control-related status, such as electric energy consumption, operation time, and outdoor temperature, can be displayed in a graph. Operators can check the detailed status of given indoor units by specifying the date to display the data per group, block, or unit address.	×	□○●
Filter sign reset/ Filter sign	Filter sign can be reset for each group or block of indoor units. Filter sign indicates that the filter on the units in a given group is due for cleaning.	□○●	□○●
Interlock setting	Operation of indoor groups or general equipment can be interlocked by the change of state (ON/OFF, mode, error of indoor groups and general equipment). (EB-50GU-A/EW-50A will execute interlocking control depending on the interlocked setting.)	○	○
Data back-up (PC)	The initial setting data, operation data (charge parameter, power consumption data) can be stored in the PC.	◎	–
BACnet® connection	CITY MULTI can easily combine into a Building Management System (BMS) via the BACnet® and M-NET adapter BAC-HD150.	○	–
Integrated control	A maximum of 40 units of AE-200A, AE-50A, and EW-50A combined can integrally be controlled from a PC, a tablet PC, or a smartphone, allowing for the controlling and monitoring of the air-conditioning units connected to it.	○●◎	○●◎

NOTE: Depending on the versions of EW-50A, some of the functions may not be available.
The external input/output terminal on AE-200A becomes unavailable when AE-200A is connected to EW-50A. Use the terminals on EW-50A in that case.

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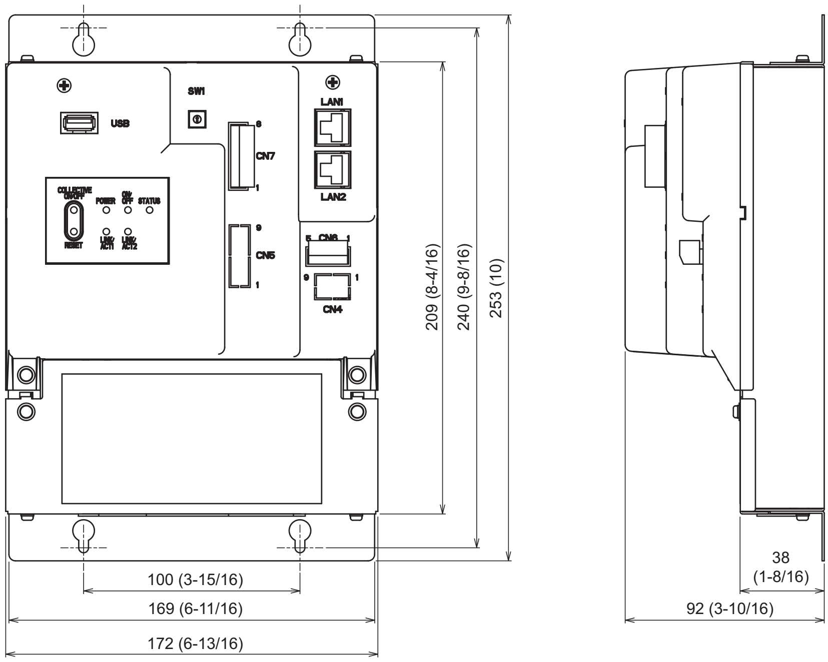
CONTROLLER

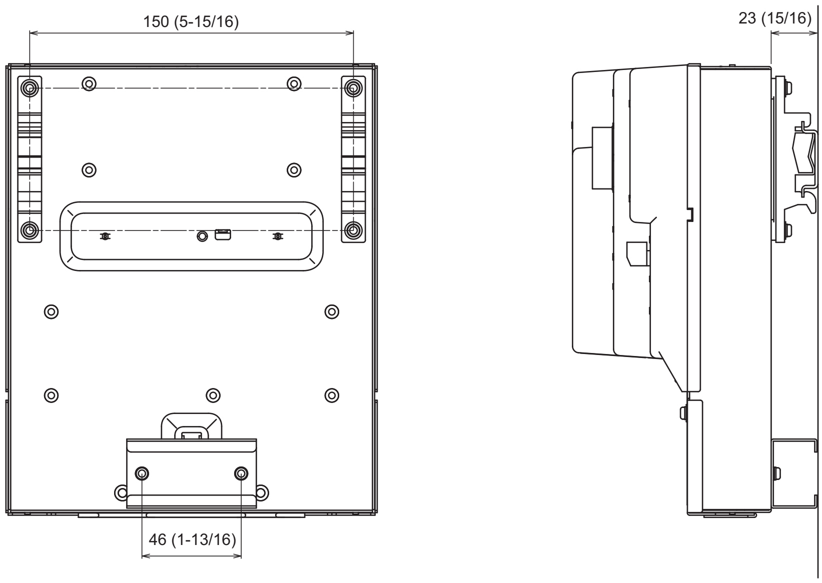
■ External dimension

When using L-fittings

Unit: mm (in)



When using DIN rail



1. Power supply to EW-50A

EW-50A needs AC power (100-240VAC) and M-NET; the former is for centralized control transmission use and the latter is for EW-50A's operating and LAN function use.
Except when the equivalent power consumption exceeds 1.5, the power supply unit, the power supply unit PAC-SC51KUA or the power supply from the outdoor unit to M-NET is not necessary.
For more details, please refer to the Installation Manual of EW-50A.

(1). The basic scheme is as follows.

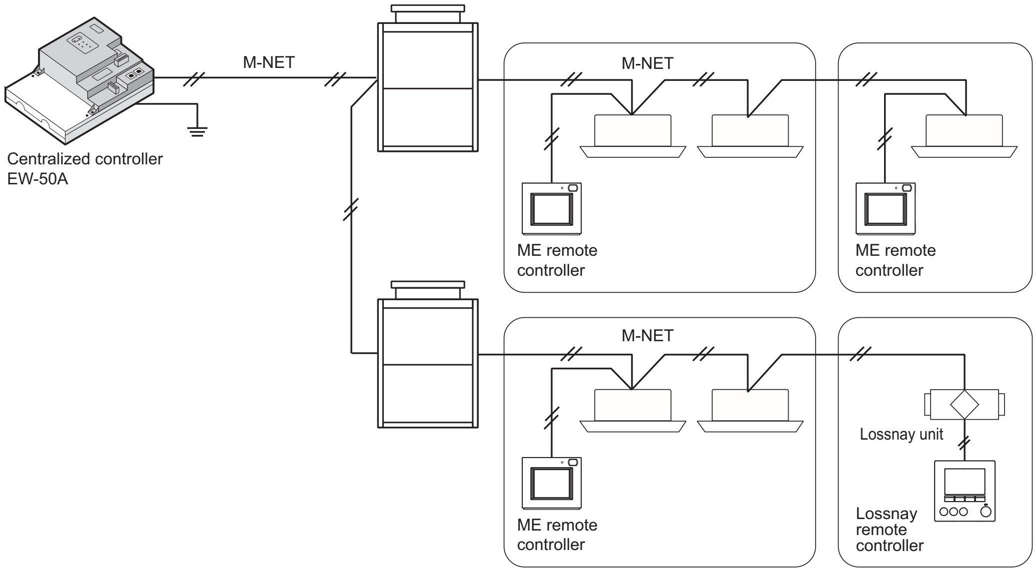


Fig.1 EW-50A basic scheme.

2. M-NET power supply

EW-50A has a built-in function to supply power to the M-NET transmission line. (the equivalent power supply 1.5)
When power is supplied from EW-50A, the types of system controllers listed in the table below are connectable.

	System controller	M-NET remote controller	
	ON/OFF remote controller	Lossnay remote controller	ME remote Controller
The equivalent power consumption	1	0.25	0.5
Connectable units	1 unit	6 units	3 units

Note	
	・Supplying power from the outdoor unit or the power supply unit, it is necessary to disconnect the M-NET power jumper CN21. (At factory setting, CN21 is connected.) ・When the equivalent power consumption exceeds 1.5, it is necessary to connect the power supply unit (PAC-SC51KUA), and disconnect the M-NET power jumper CN21 on EW-50A. ・**When connecting both EW-50A and BAC-HD150 (BM ADAPTER) to the same M-NET system, certain restrictions apply. Consult your dealer for details.**

3. External input/output usage

✻ To use the external signal input, an external I/O adapter (PAC-YG10HA-E; sold separately) and an external power supply are required.

NOTE: Connect the external input/output adapter to each AE-200A/AE-50A/EW-50A.
(External input signal to AE-200A cannot perform the collective operations (e.g., emergency stop) for AE-50A/EW-50A systems.)

[External signal input function]

Using external contact signals (12 or 24 VDC), the following collective operations for all connected air conditioning units can be controlled: Emergency stop, ON/OFF operation, and Prohibit/Permit local remote controller operation.

(1) External signal input function setting

Setting mode	Description
[Demand (Level signal)/Not in use] (Factory setting)	Select this mode when inputting a demand level using a level signal, or when not using an external signal input function. A demand signal of four different levels will be input.
[Emergency Stop (Level signal)]	Using a level signal, all the air conditioning units connected to the AE-200A or AE-50A /EW-50A will be stopped collectively in an emergency. During an emergency stop, the ON/OFF operation from the local remote controllers will be prohibited, and the ON/OFF operation and Prohibit/Permit settings on the AE-200A or AE-50A/EW-50A will be prohibited. A demand signal of three different levels will be input.
[ON/OFF (Level signal)]	Using a level signal, all the air conditioning units connected to the AE-200A or AE-50A /EW-50A will be run or stopped collectively. The ON/OFF operation from the local remote controllers will be prohibited, and the ON/OFF operation and Prohibit/Permit settings on the AE-200A or AE-50A/EW-50A will be prohibited. Scheduled operations will not be performed.
[ON/OFF/Prohibit/Permit (Pulse signal)]	Using a pulse signal, all the air conditioning units connected to the AE-200A or AE-50A /EW-50A will be run or stopped collectively, or the operation from the local remote controllers will be prohibited or permitted collectively.

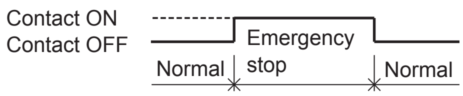
* General equipment connected via a DIDO controller (PAC-YG66DCA) cannot be collectively run or stopped by using the external signal input function unless [Emergency Stop (Level signal)] is selected and relevant switches on the DIDO controller are set.
* The external input function cannot be used on HWHP (CAHV) units.

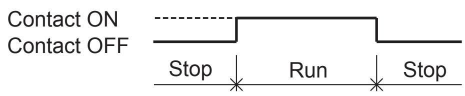
(2) External signal input specifications

CN5	Lead wire from PAC-YG10HA-E	Demand (Level signal)	Emergency Stop (Level signal)	ON/OFF (Level signal)	ON/OFF/Prohibit/Permit (Pulse signal)
No. 5	Orange	Demand level 1	Emergency stop signal, Normal operation signal	ON signal, OFF signal	ON signal
No. 6	Yellow	Demand level 2	Demand level 2	–	OFF signal
No. 7	Blue	Demand level 3	Demand level 3	–	Prohibit signal
No. 8	Gray	Demand level 4	Demand level 4	–	Permit signal
No. 9	Red	External power supply (+12 or +24 VDC)			

(3) Level signal and pulse signal

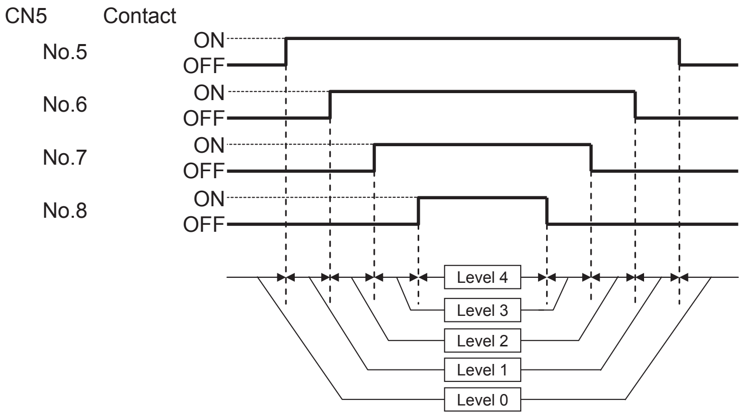
(A) Level signal



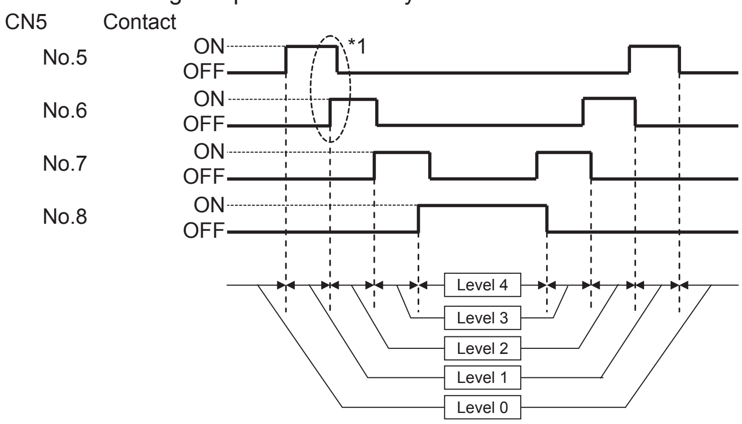


How the demand level is determined

Demand level signal specification: When higher levels’ contacts turn on, lower levels’ contacts also stay on.



Demand level signal specification: Only the current levels’ contacts turn on.

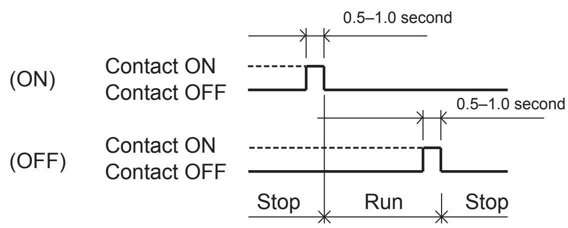


*1 The specification must be followed in the following order: ① When the level changes, the contact of the level after the change turns on.; ② The contact of the level before the change turns off.

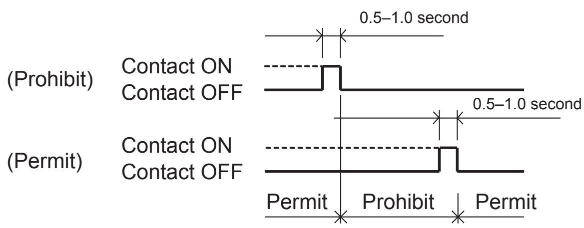
1. If [Emergency stop (Level signal)] is selected, the air conditioning units in normal operation will stop when the contact turns on. Even when the contact turns off, these units will remain stopped. They must be started up manually after the emergency stop is reset.
2. If [ON/OFF (Level signal)] is selected, the air conditioning units that are stopped will start operation when the contact turns on. Conversely, the units that are in operation will stop when the contact turns off.
3. Demand control is performed when the demand level contact turns on. If two different demand levels' contacts turn on at the same time, the demand control will be performed with the higher level demand.
   (Even if the demand control is not performed due to unexpected problems, Mitsubishi Electric will not be responsible for exceeding the maximum power demand.)

(B) Pulse signal

(Example) ON/OFF



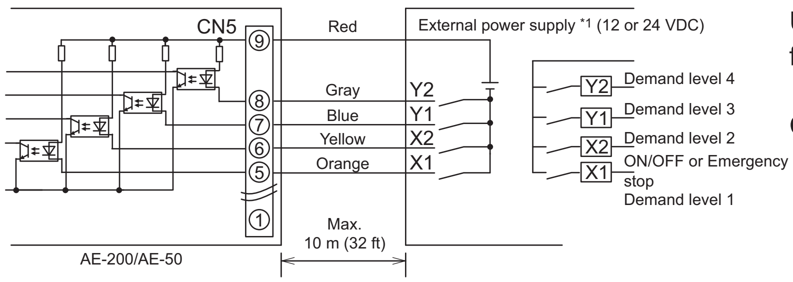
(Example) Prohibit/Permit



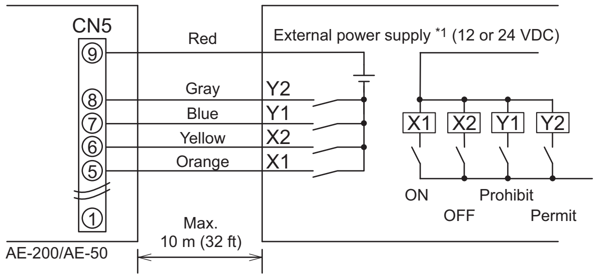
1. If the input pulse signal is the same as the current operation status of the air conditioning units, no status change will occur. (For example, if an ON signal is input while the air conditioning units are in operation, the units will continue their operation.)
2. If the operation from the local remote controller is prohibited, ON/OFF status, operation mode, or temperature setting cannot be changed and filter sign cannot be reset from the local remote controller.
3. The pulse width (contact ON) should be between 0.5 and 1.0 second.

(4) Recommended circuit

(A) Level signal



(B) Pulse signal



Use relays X1, X2, Y1, and Y2 that meet the following specifications.

Contact rating

Rated voltage: 12 VDC or above

Rated current: 0.1 A or above

Minimum applied load: DC 1 mA

*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
Connect the external power supply in the correct polarity to input and output the signals.
Connect ⑤ – ⑧ (see the figure at left) to the negative side.

Important

- **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.**
- **Connect the external power supply in the correct polarity to avoid malfunctions.**

Note

- The relays, external power supply, and extension cables are not supplied.
- The total length of the lead wire and extension cable should not exceed 10 m (32 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Cut the excess cable near the connector, and insulate the end of the unused cable with tape.

[Pulse signal input function]

Using pulse signals directly input from metering device such as watt-hour meter, billing data and energy management data will be obtained based on the cumulative number of pulse signal input.

Note
- To input pulse signals directly from the metering device to the EW-50A, use the connector connected to the EW-50A. (Aprecision screwdriver for M1 screws is required.).

Usability of a built-in PI controller for each function

Function	AE-200A	AE-50A	EW-50A
Apportioned electricity billing function (option)	x*1	V*2	V*2
Energy management	V	V	V
Demand function (option)	V	V	V

(V): Usable, (x): Not usable

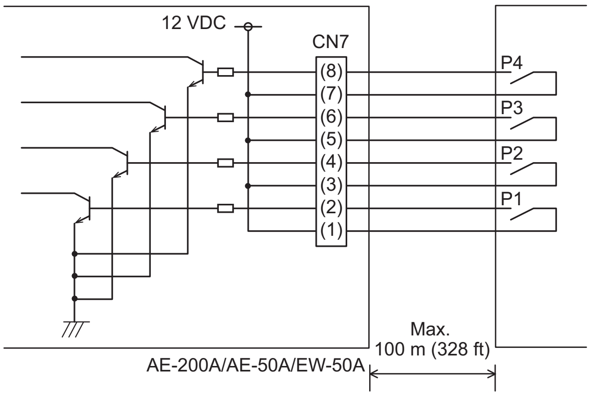
*1 A built-in PI controller on the AE-200A cannot be used for an apportioned electricity billing function. Use a built-in PI controller on the AE-50A or EW-50A.

*2 Using a PI controller (PAC-YG60MCA) is recommended instead of a built-in PI controller on the AE-50A/EW-50A when using an apportioned electricity billing function. (Discrepancies may occur between the built-in PI controller reading and the actual electric energy because the pulse input cannot be obtained during the AE-50A/EW-50A power failure, shutoff process, and software update.)

(1) Pulse signal input specifications

CN7	Signal
No. 7, 8	Metering device 4 (count input)
No. 5, 6	Metering device 3 (count input)
No. 3, 4	Metering device 2 (count input)
No. 1, 2	Metering device 1 (count input)

(2) Recommended circuit



A voltage of 12 VDC is applied to CN7. Do not apply a power voltage from any other power source.

Contact rating
Rated voltage: 12 VDC
Rated current: 0.1 A or above
Minimum applied load: DC 1 mA

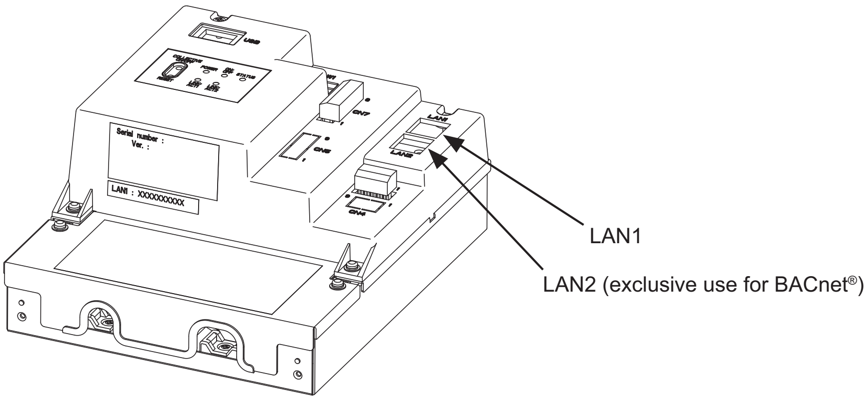
Note
- The total length of the lead wire and extension cable should not exceed 100 m (328 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
- Cut the excess cable near the connector, and insulate the end of the unused cable with tape.
- Do not run the signal input cable adjacent to the M-NET transmission and power cables. Do not let the cable form a loop.
- Peel off the sheath to 6 ±1 mm (4/16 ±1/16 in) from the end, and securely insert the cable into the terminal.
- Leave adequate slack in the cables so that the weight of them will not strain the terminal connectors. Use cable clamps or trunk terminals as necessary.

4. Connecting the LAN cable

⚠CAUTION	**To prevent unauthorized access, always use a security device such as a VPN router when connecting to the Internet.**

Connect the LAN cable to the LAN1 port on the EW-50A. (The LAN2 port is exclusively used for BACnet® function.)

- The LAN cable is not supplied. Use a category 5 or above straight LAN cable.
- Use a switching HUB compatible with 100 BASE.
- The maximum distance between the switching HUB and AE-200A/AE-50A/EW-50A is 100 m (328 ft).
- The recommended number of connected devices such as gateway, router, layer 3 switch, or HUB between the AE-200A/AE-50A/EW-50A is four or less.
  (Transmission round-trip delay time must not exceed one second. If the transmission delay time is long, a communication error may be detected. Check the transmission delay time.



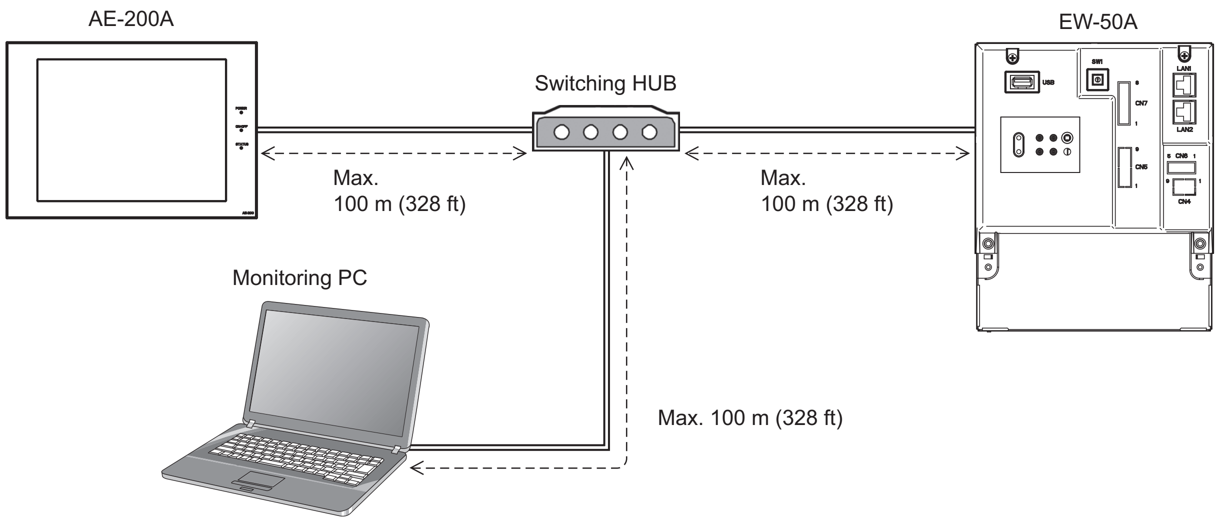
Note

- LAN must be installed before the unit installation. Route the LAN cable to the EW-50A in the same way as the M-NET transmission cables.
- When connecting the EW-50A to an existing LAN, consult the system administrator to decide the IP address.

5. Confirming the LAN transmission delay time

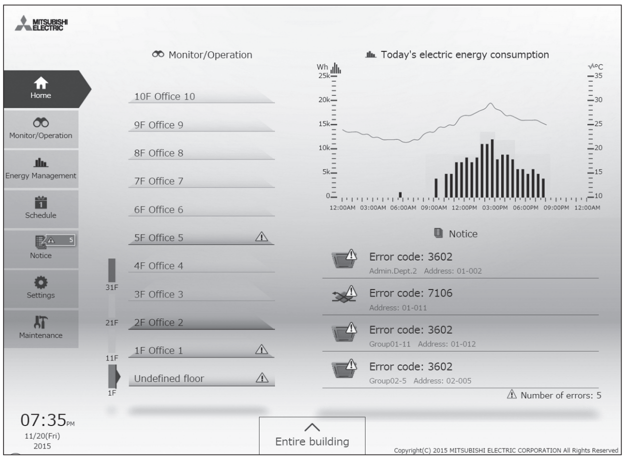
Connect a monitoring PC to a device such as HUB that is connected to the AE-200A/AE-50A/EW-50A. Send a command from the PC to the AE-50A/EW-50A, and receive the response from the AE-50A/EW-50A.
Check the time between sending and receiving on the PC display.

Sample system connection

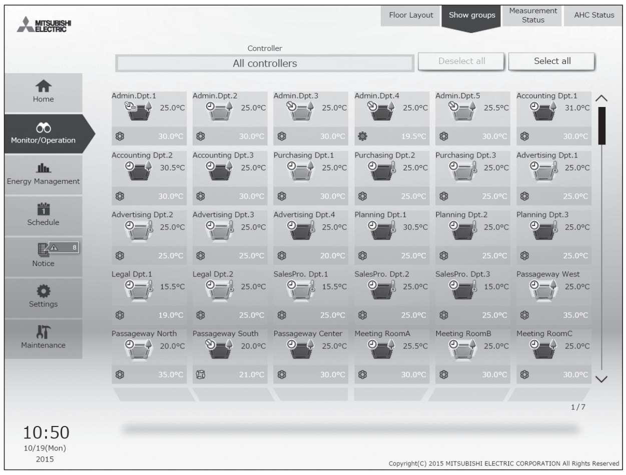


6. Browser screens of EW-50A

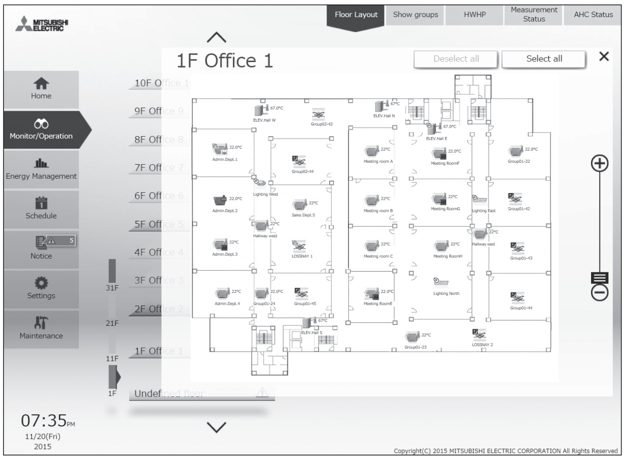
(1) PC, Tablet device



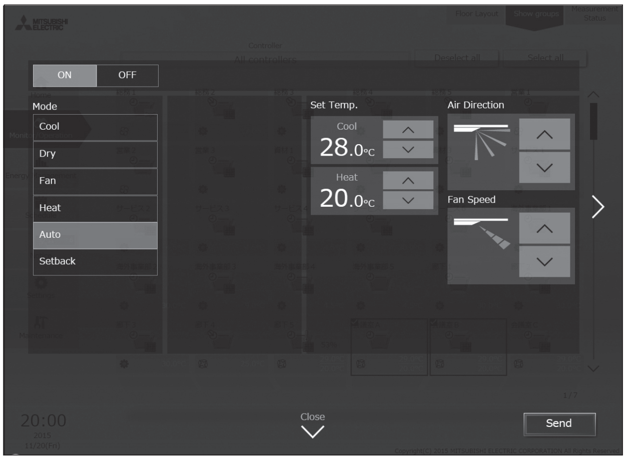
Home



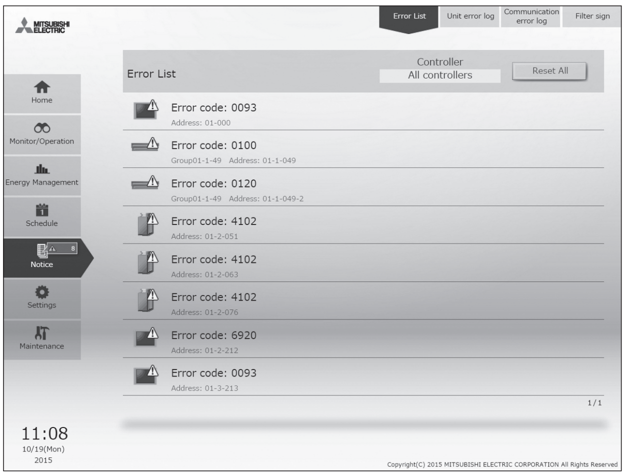
Monitor (Show Groups)



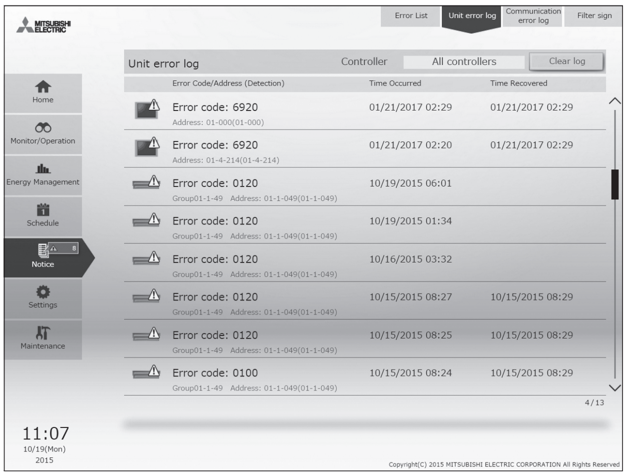
Monitor (Floor Layout)



Operation

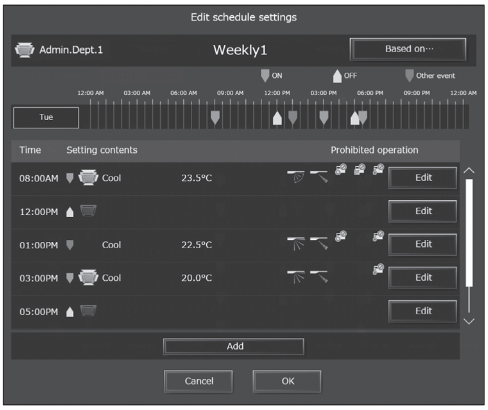


Error List

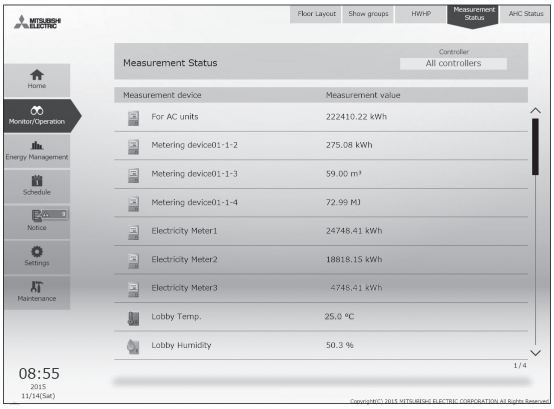


Unit Error Log

CONTROLLER

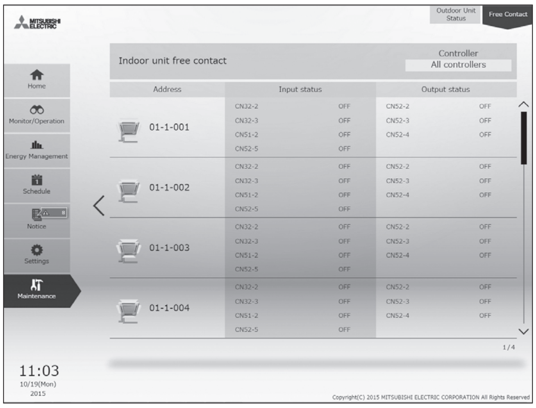


Weekly Schedule 1

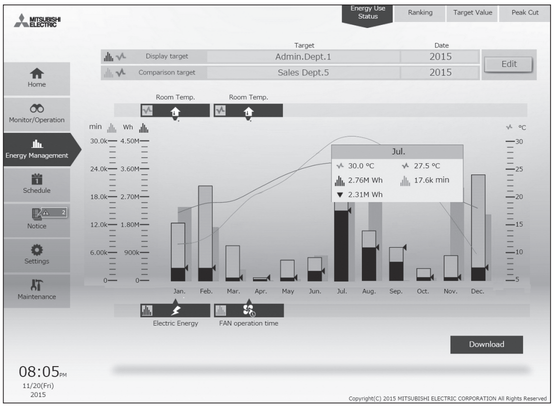


Measurement Status Monitor (Temperature Sensor/Humidity Sensor /Measurement Meter)

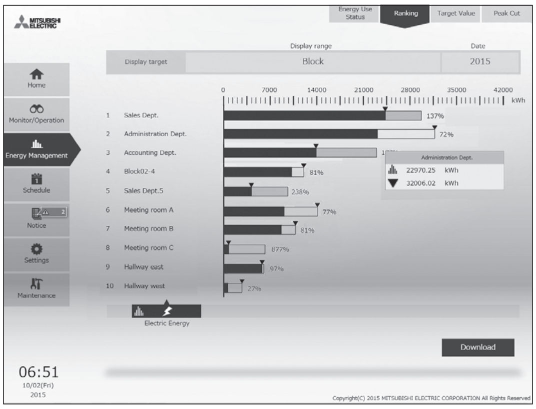
Advanced HVAC CONTROLLER Status Monitor



Free Contact Status Monitor



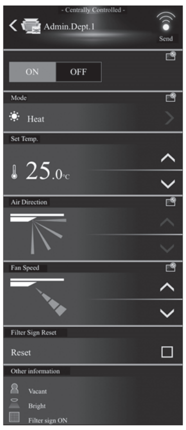
Energy Management Monitor (Energy Use Status)



Energy Management Monitor (Ranking)

(2) Smart phone

Monitor (Show Groups)



Operation

3-5. Power supply unit [PAC-SC51KUA]

PAC-SC51KUA supplies DC power of M-NET(22-30V) and 24V at TB2 and TB3 respectively; the former is for centralized transmission use and the latter is for AG-150A-A operation and LAN function use.

1. When using PAC-SC51KUA as the power supplier for system controller, the capacity for system controller is considered as follows.

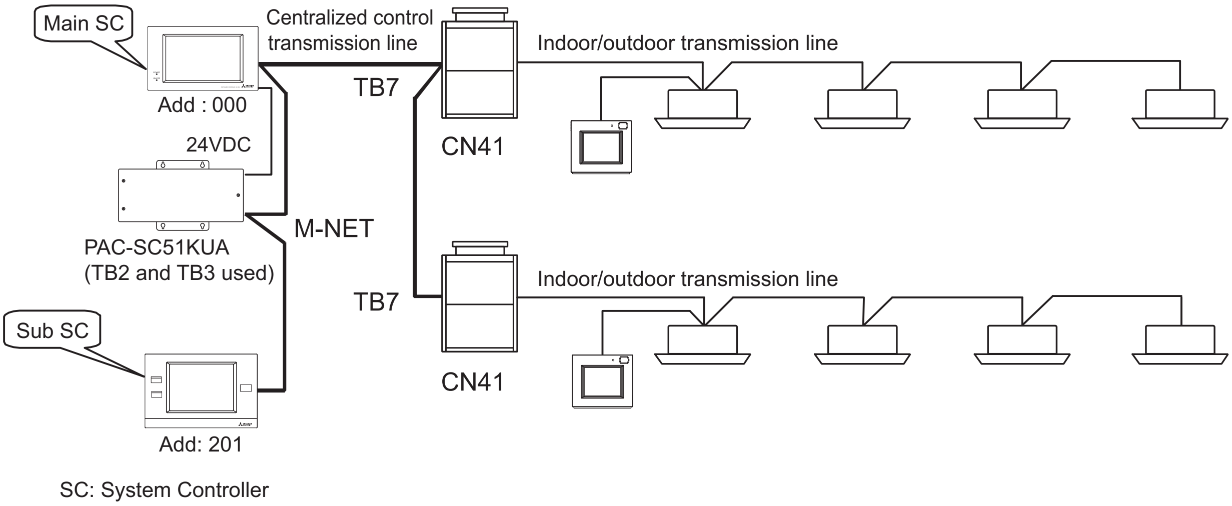


Fig. 1 Equivalent power consumption of controllers

In this case, pay attention to leave the power supply switch connector on CN41 of the Outdoor unit as the factory setting before shipment.

Taking the power consumption of the control board of Indoor unit as 1, the power consumption of various controllers is rated at Table 1.

Table 1 The equivalent power consumption and the equivalent number of units of controllers

Category	Centralized controller			System controller		M-NET remote controller
Model	AG-150A-A EB-50GU-A	AE-200A AE-50A *1	EW-50A *1	Touch controller (TC-24B)	ON/OFF remote controller (PAC-YT40ANRA)	ME Remote Controller (PAR-U01MEDU)
The equivalent power consumption	0.5	0	0	1.5	1	0.5
The equivalent number of units	1	0	0	5	1	1

*1 When supplying power to the M-NET from PAC-SC51KUA, remove the connector from CN21 so that power will not be supplied to the M-NET from the centralized controller.

PAC-SC51KUA is capable to supply the equivalent power up to 5, therefore the maximum connectable number of system controller is as follows.

Table 2 Max. connectable quianity of controller when using PAC-SC51KUA

Centralized controller*1	System controller		M-NET remote controller
AG-150A-A EB-50GU-A	Touch controller (TC-24B)	ON/OFF remote controller (PAC-YT40ANRA)	ME remote controller (PAR-U01MEDU)
1 unit	3 units	5 units	10 units

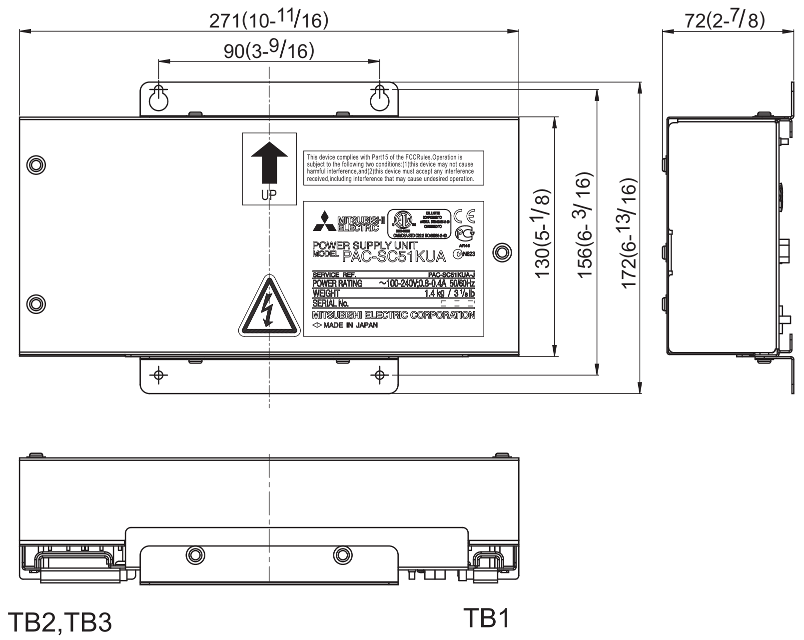
*1: According to the system restrictions, PAC-SC51KUA can be connected to only one centralized controller.

As the air conditioner control system may combine all kinds of system controllers, the total power consumption of system controllers need to count with Table 2.
For example, the controller system contains 1 AG-150A-A, 2 ON/OFF remote controllers (PAC-YT40ANRA), and 3 ME remote controller (PAR-U01MEDU) connected at centralized control communication line.
Then the total power consumption is
$1 \times 0.5 + 2 \times 1 + 3 \times 0.5 = 4.0 < 5$.
One PAC-SC51KUA is therefore enough. The total power consumption should not exceed 5.
Also, the total equivalent number of units is
$1 \times 1 + 2 \times 1 + 3 \times 1 = 6 < 40$.
One PAC-SC51KUA is therefore enough. The total equivalent number of units should not exceed 40.

CONTROLLER

■ External dimension

Unit: mm [in.]



3-6. BACnet®

CITY MULTI can easily combine into a Building Management System (BMS) via EW-50A (AE-200A). BACnet® is an open transmission protocol widely used at BMS, and related equipment control. CITY MULTI is compatible with large-scale BMS management via BACnet®.

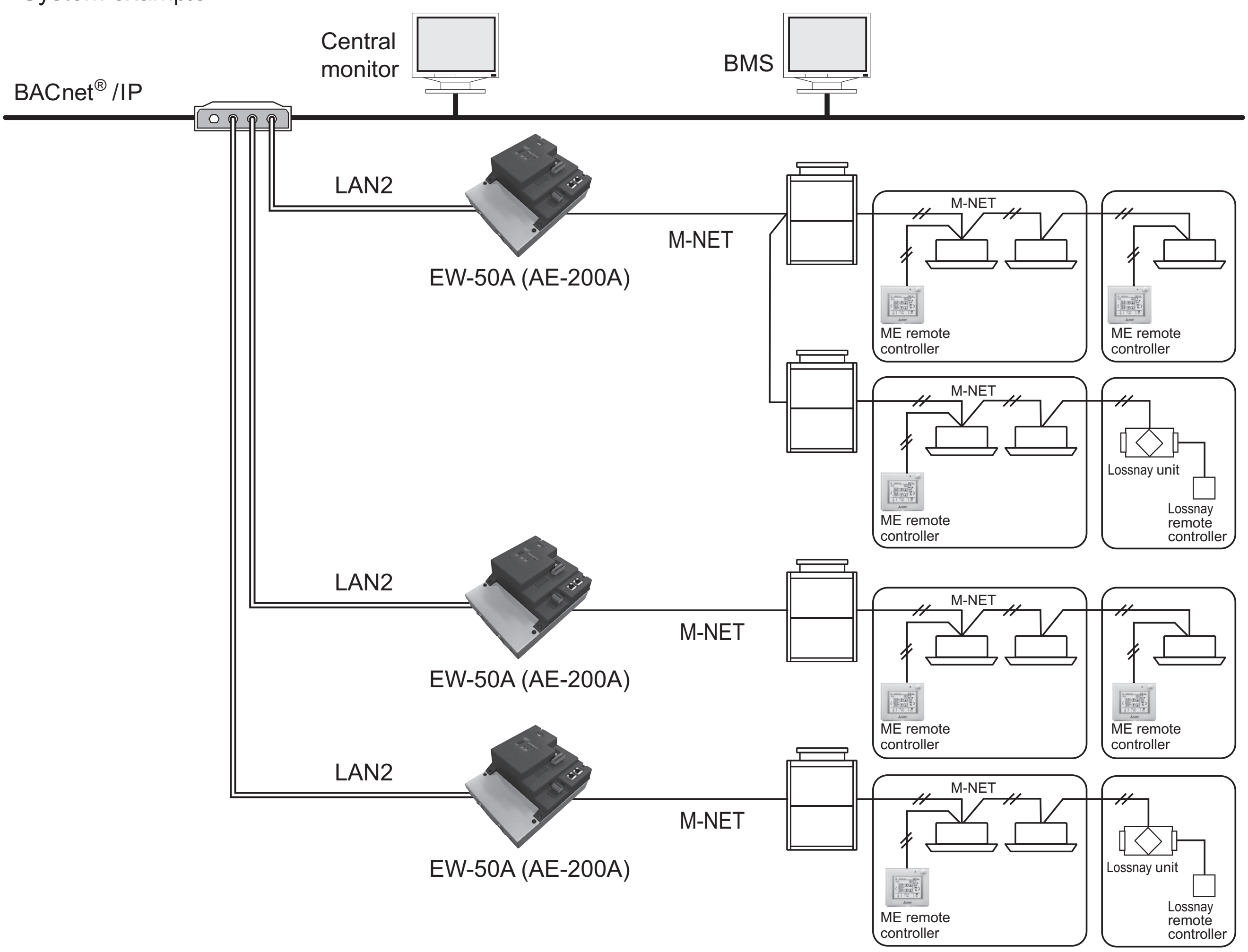
EW-50A (AE-200A) can control up to 50 units/groups (including Lossnay).
*To use the BACnet® function on EW-50A (AE-200A), BACnet® license registration is required.

■ Functions

FUNCTION	CONTENT
Operation	
ON/OFF	ON/OFF
Mode	Cooling/Drying/Heating/Auto/Fan/Setback
Fan Speed	Low-Mid2-Mid1-High-Auto
Air Direction	Horizontal-60°-80°-100°swing
Set Temperature	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.
Filter Sign Reset	Normal/Reset
Permit/Prohibit	ON/OFF, Mode, Filter sign reset, Set temp, Fan speed
Forced Off	Reset/Execute
Ventilation Mode	Heat Recovery/Bypass/Auto
Air to Water Mode	Heating/ECO/Hot Water/Antifreeze/Cooling

FUNCTION	CONTENT
Monitoring	
ON/OFF	ON/OFF
Mode	Cooling/Drying/Heating/Auto/Fan/Setback
Fan Speed	Low-Mid2-Mid1-High-Auto
Air Direction	Horizontal-60°-80°-100°swing
Set Temperature	Changes the set temperature. * Set temperature range varies depending on the indoor unit model.
Filter Sign	ON/OFF
Permit/Prohibit	ON/OFF, Mode, Filter sign reset, Set temp, Fan speed
Indoor Temperature	Temperature
Alarm Signal	Normal/Error
Error Code	2 Character code- Indicates all unit alarms
Error Code Detail	4 Character code- Indicates all unit alarms
Communication State	Normal/Error
Ventilation Mode	Heat Recovery/Bypass/Auto
Air to Water Mode	Heating/ECO/Hot Water/Antifreeze/Cooling
Apportioned Electric Energy	Group, Interlocked Units [0.1 kWh]
PI controller Electric Energy	[0.1 kWh]
Apportionment Parameter	No Units
Night Purge State	ON/OFF
Thermo On/Off State	ON/OFF
External Heat Source State	ON/OFF
Trend Log	Indoor Temp, Apportioned Electric Energy, PI controller Electric Energy, Apportionment Parameter

■ System example



CONTROLLER

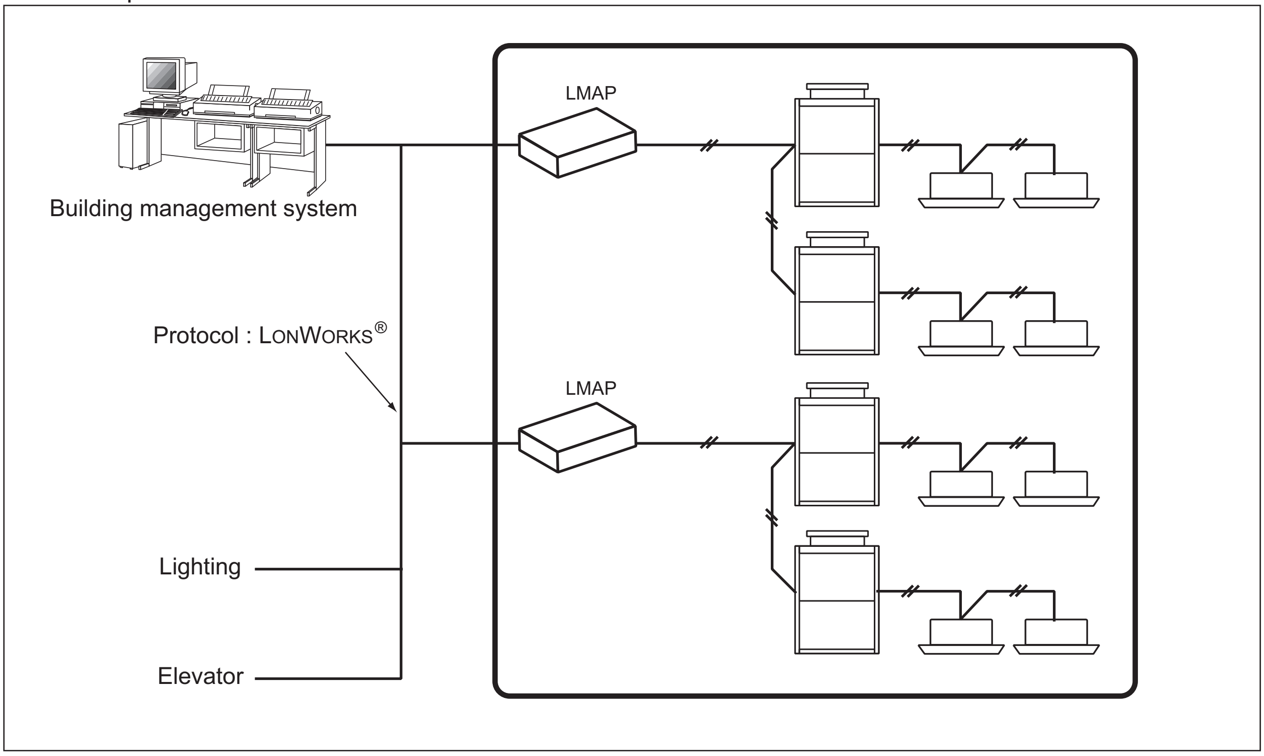
3-7. LONWORKS® interface [LMAP04U-E]

Dual Set Point

CITY MULTI can easily combine into a Building Management System (BMS) via the LonWorks® and M-NET adapter LMAP04U-E. LonWorks® is an opened transmission protocol widely used at BMS, and related equipment control. CITY MULTI is therefore compatible with large-scaled BMS management via LonWorks®.

One LMAP04U-E serves up to 50 indoor units. (CITY MULTI, Mr.Slim, and Lossnay.)

■ System example



Communication items at LonWorks® and M-NET Adapter LMAP04U-E

Operation	On/Off Mode Set point from network (Set temp.) Fan speed	State Monitoring	Emergency On/Off Collective On/Off Mode Set point from network (Set temp.) Fan speed
	Prohibit local On/Off Prohibit local Mode Prohibit local Set temp. Collective Local Prohibit Forced Thermostat OFF Filter Sign Reset Time Stamp Limit Temperature Setting Range (*2) Simplified Locking		Prohibit local On/Off Prohibit local Mode Prohibit local Set temp. Collective Local Prohibit Forced Thermostat OFF Run Time for Filter
	Batch Off		Indoor temperature Defrost Group Number Alarm signal Collective Alarm for Indoor Unit Collective Alarm for LM ADAPTER Error Code Error Address Thermo On/Off state_1 (*1) Thermo On/Off state_2 (*1) Model Code (*1)
	Set point from network (cool) Set point from network (heat) Set point from network (auto) Set point in setback from network (high) Set point in setback from network (low)		Set point from network (cool) Set point from network (heat) Set point from network (auto) Set point in setback from network (high) Set point in setback from network (low)

Note
*1: This product does not have a charge function.
The charge (apportioning) function must be prepared separately in the master system.
*2: This function is not available when PAR-U01MEDU is connected to the system.

■ Environment specification

Item		Description
Connected Equipment		MITSUBISHI ELECTRIC Multiple split-type air conditioners CITY MULTI Split-type air conditioners Mr.Slim Heat recovery ventilators Lossnay (✻For details of the connectable models,please contact the dealer.)
Number of Units		LMAP can control 50 indoor units (including Lossnay)
Neuron CHIP		TMPN3150/FT3150-P20 (10MHz)
Network Transceiver		FTT-10A/FT-X1 (Free Topology 78kbps)
Performance	Average communication capacity	2.5 inputs/second
	Peak communication capacity	50 inputs/second (for one second)

✻ The proper communication is not obtainable when communication intervals exceed its performance, assure sufficient intervals.
✻ ACK Service is recommended for the network service.
✻ Detailed specifications for the LONWORKS® network can be found in "FTT-10A Free Topology Transceiver User's Guide" or " FT3120/FT3150 Smart Transceiver Data Book" by Echelon Corporation.

<LMAP04U-E Network Variables>

Please obtain the Network Variables Specification for details from your dealer.

Indoor[1]-[50]

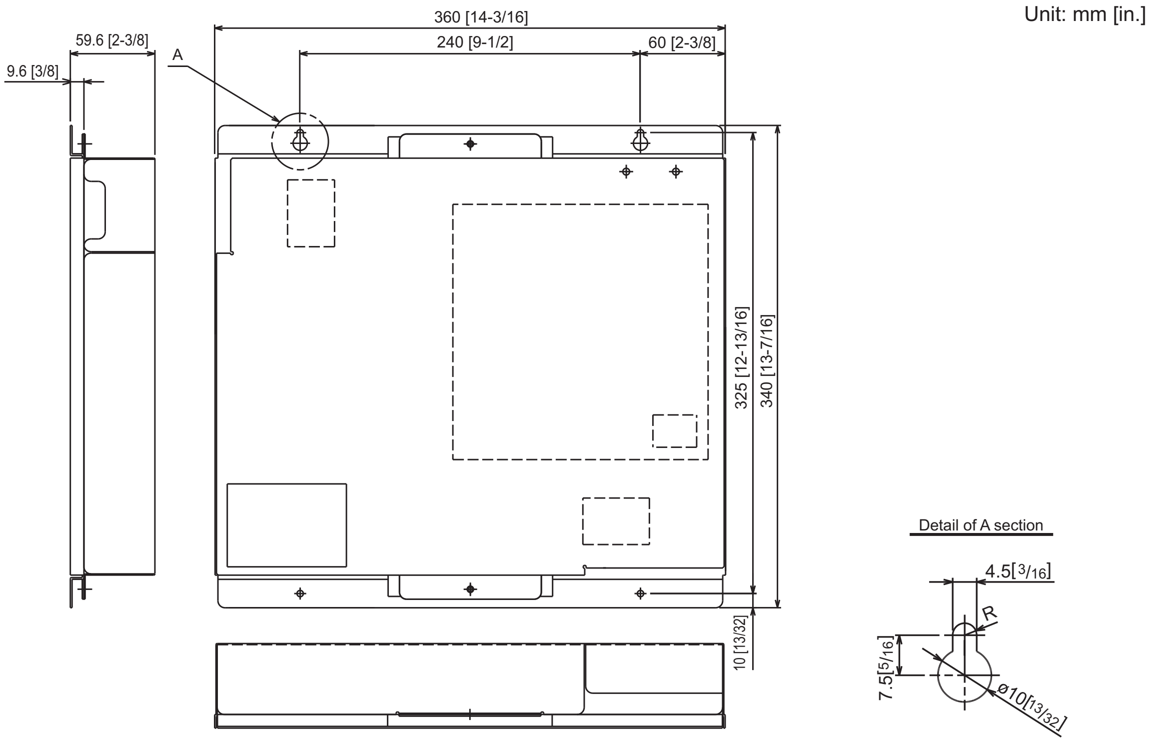
Network Variables

	Input		Output		
	nv1n	nviOnOff_n SNVT_switch	nv2n	nvoOnOff_n SNVT_ switch	
	nv3n	nviMode_n SNVT_hvac_mode	nv4n	nvoMode_n SNVT_hvac_mode	
(*8)	nv5n	nviSetP_n SNVT_temp_p	nv6n	nvoSetP_n SNVT_temp_p	(*8)
(*9)	nv7n	nviCoolSetP_n SNVT_temp_p	nv8n	nvoCoolSetP_n SNVT_temp_p	(*9)
(*9)	nv9n	nviHeatSetP_n SNVT_temp_p	nv10n	nvoHeatSetP_n SNVT_temp_p	(*9)
(*9, 10, 11)	nv11n	nviAutoSetP_n SNVT_temp_p	nv12n	nvoAutoSetP_n SNVT_temp_p	(*9, 10, 11)
	nv13n	nviSetBackHP_n SNVT_temp_p	nv14n	nvoSetBackHP_n SNVT_temp_p	
	nv15n	nviSetBackLP_n SNVT_temp_p	nv16n	nvoSetBackLP_n SNVT_temp_p	
	nv19n	nviFanSpeed_n SNVT_switch	nv20n	nvoFanSpeed_n SNVT_switch	
(*2, 3, 4)	nv21n	nviProOnOff_n SNVT_switch	nv22n	nvoProOnOff_n SNVT_switch	(*2, 3, 4)
(*2, 3, 4)	nv23n	nviProMode_n SNVT_switch	nv24n	nvoProMode_n SNVT_switch	(*2, 3, 4)
(*2, 3, 4)	nv25n	nviProSetP_n SNVT_switch	nv26n	nvoProSetP_n SNVT_switch	(*2, 3, 4)
(*5)	nv27n	nviThermoOff_n SNVT_switch	nv28n	nvoThermoOff_n SNVT_switch	(*5)
(*6)	nv29n	nviFiltReset_n SNVT_switch	nv30n	nvoOnTime_n SNVT_time_hour	(*6)
			nv31n	nvoSpaceTemp_n SNVT_temp_p	
			nv32n	nvoAlarm_n SNVT_switch	
			nv33n	nvoErrCode_n SNVT_count	
			nv34n	nvoErrAdrs_n SNVT_count	
			nv35n	nvoThermoSt_n SNVT_state	
			nv36n	nvoThermo_n SNVT_switch	
			nv38n	nvoIcMdlSize_n SNVT_count	
			nv39n	nvoGroupNo_n SNVT_count	(*7)

Notes

*1: "n" of the network variable shows M-NET address of indoor units.
*2: It may be unable to be used by the system configuration of air-conditioners units.
*3: It is possible to use with an "MA or ME" remote controller.
*4: For the use of this function, turn ON the switch(SW1-1) on LM ADAPTER.(Factory setting "OFF")
*5: For the use of this function, turn ON the switch(SW1-8) on LM ADAPTER.(Factory setting "OFF")
*6: For the use of this function, turn ON the switch(SW1-4) on LM ADAPTER.(Factory setting "OFF")
*7: It is possible to use with other system controller.
*8: This function is available only for the conventional indoor units which don't support the dual set point.
*9: This functions are available for the units which support the dual set point.
*10: This function is available for the DOAS was manufactured in October, 2012 or later, when it uses with the DOAS.
*11: This function is available when the auto mode should be controlled by single set point like the conventional one, when the dual set point is valid.

■ External dimension



Item			Description
Dimensions			340 (H) x 360 (W) x 59.6 (D) [13-7/16(H) x 14-3/16 (W) x 2-3/8(D)]
Net Weight			3.4 kg (7-1/2 lb)
Power Source			~ 208 - 230V (60 Hz)
Current Consumption			50 mA (Maximum)
Operation Environment	Temperature	Operating Range	-15 to 43°C / 5 to 109°F
		Storage Range	-20 to 60°C / -4 to 140°F
	Humidity		30 to 95 RH (No condensation)
Installation Environment			In the control box

CONTROLLER

3-8. Transmission booster [PAC-SF46EPA-G]

The Outdoor unit supplies transmission power 30VDC for the indoor-outdoor transmission line at its connector TB3 and TB7. The power is consumed by the Indoor unit, ME remote controller, and System controllers.
When the total quantity of Indoor units, and ME remote controller, and equivalent number of units is over 40, or when transmission power supply is not enough, the transmission booster PAC-SF46EPA-G should be designed into the air-conditioner system to ensure the system communication.

Designing PAC-SF46EPA-G into an air-conditioner system.
Taking the power consumption of Indoor unit as 1, the equivalent power consumption or supply of others are listed at Table 1 and Table 2.

Table 1 The equivalent power consumption and the equivalent number of units

Category	Model	The equivalent power consumption	The equivalent number of units
Indoor unit	Sized P04-P96, PEFY-AF1200CFM-E	1	1
	PEFY-AF1200CFMR-E	2	2
BC controller	CMB	2	1
PWFY *1	P36NMU-E-BU	6	1
	P36NMU-E2-AU	1	1
	P72NMU-E2-AU	5	1
MA remote controller/Lossnay	PAR-CT01MAU PAR-40MAAU PAC-YT53CRAU PAR-FA32MA LGH-F-RX$_5$-E1 LGH-F-RVX-E PZ-60DR-E PZ-61DR-E PZ-43SMF-E	0	0
ME remote controller	PAR-U01MEDU	0.5	1
System controller	AE-200A AE-50A EW-50A LM-AP	0	0
	AG-150A-A EB-50GU-A PAC-IF01AHC-J	0.5	1
	TC-24B	1.5	5
	PAC-YG60MCA PAC-YG66DCA PAC-YG63MCA	0.25	1
ON/OFF controller	PAC-YT40ANRA	1	1
MN converter	CMS-MNG-E	2	1
Outdoor/Heat source unit	TB7 power consumption	0	0
System control interface	MAC-333IF-E	0	0
A-M converter	PAC-IF01MNT-E	1	2

*1 PWFY cannot be connected to PUMY model.

Table 2 The equivalent power supply

Category	Model	The equivalent power supply		
Transmission Booster	PAC-SF46EPA-G	25 *1		
Power supply unit	PAC-SC51KUA	5		
Expansion controller	PAC-YG50ECA	6		
BM ADAPTER	BAC-HD150	6		
System controller	AE-200A/AE-50A	0.75		
	EW-50A	1.5		
	LM-AP	0		
Outdoor/Heat source unit		TB3 and TB7 total	TB7 only	TB3 only
	Outdoor unit other than the following units *2	32 *1	6	32*1 - equivalent power supplied to TB7
	S-Series outdoor unit	12 *1	0	12 *1
	TLMU/TKMU outdoor unit	32 *1	- *3	32 *1

*1 When one or more indoor units listed below is connected, subtract 3 from the equivalent power supply.

Table 3

Category	Model
Indoor unit	Sized P72, P96 PEFY-AF1200CFM(R)-E

*2 If PAC-SC51KUA is used to supply power at TB7 side, no power supply need from Outdoor/Heat source unit at TB7, Connector TB3 itself will therefore have 32.

With the equivalent power consumption values and the equivalent number of units in Table 1 and Table 2, PAC-SF46EPA-G can be designed into the air-conditioner system to ensure proper system communication according to (A), (B), (C).

(A) Firstly, count from TB3 at TB3 side the total equivalent number of units of Indoor units, ME remote controller, and System controllers. If the total equivalent number of units reaches 40, a PAC-SF46EPA-G should be set.

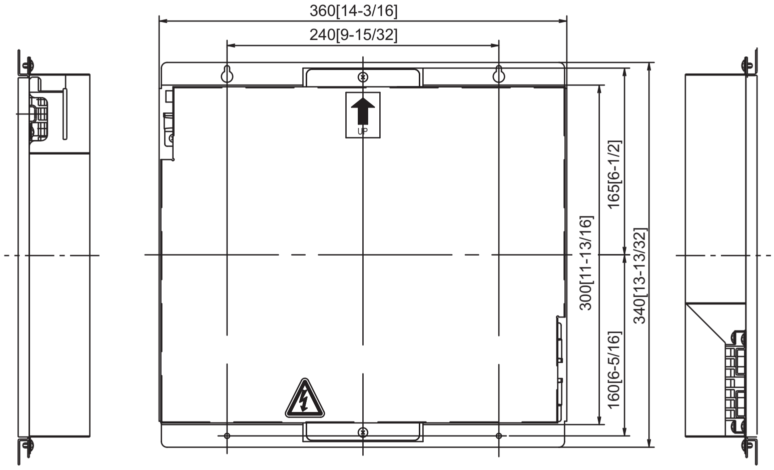
(B) Secondly, count from TB7 side to TB3 side the total transmission power consumption. If the total equivalent power supply reaches 32, a PAC-SF46EPA-G should be set. Yet, if a PAC-SC51KUA or another controller with a built-in power supply, such as PAC-YG50ECA, is used to supply power at TB7 side, count from TB3 side only.

(C) Thirdly, count from TB7 at TB7 side the total transmission power consumption, If the total equivalent power supply for only TB7 reaches 6, a PAC-SF46EPA-G should be set. Also, count from TB7 at TB7 side the total equivalent number of units of System controllers, and so on. If the total equivalent number of units reaches 40, a PAC-SF46EPA-G should be set.

* The equivalent power supply of S-Series outdoor unit is 12.
* When one or more indoor units listed in Table 3 is connected, subtract 3 from the equivalent power supply.

■ External dimension

Unit: mm [in.]



3-9. AHC ADAPTER [PAC-IF01AHC-J]

The Advanced HVAC CONTROLLER (AHC) comprises MITSUBISHI ELECTRIC's AHC ADAPTER (PAC-IF01AHC-J) and α2 SIMPLE APPLICATION CONTROLLER* (ALPHA2).

* α2 SIMPLE APPLICATION CONTROLLER is one of the Programming Logic Controllers manufactured by MITSUBISHI ELECTRIC CORPORATION.

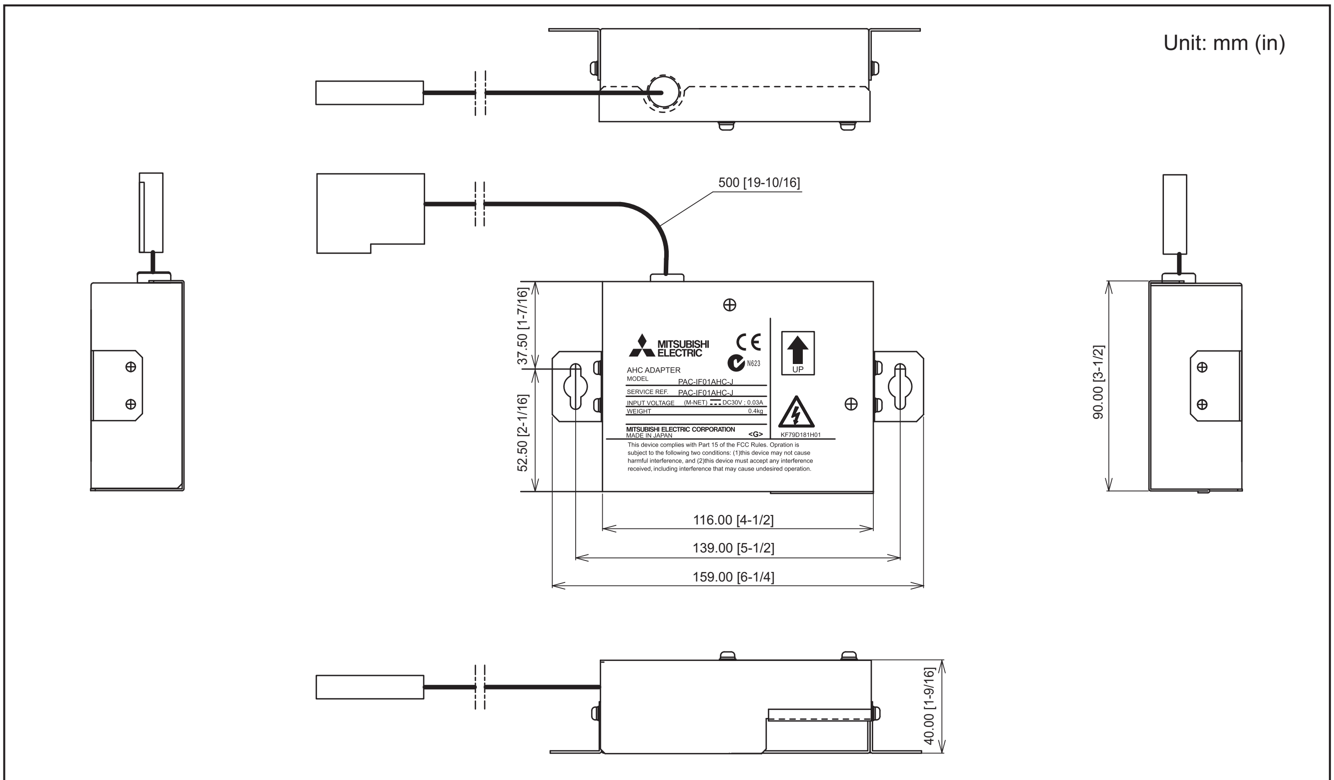
AHC allows for the connection of MITSUBISHI ELECTRIC's air conditioning network system (M-NET) to other systems, which was not possible with the use of ALPHA2 alone. AHC provides the following functions:

1) Controls external devices using the sensor data of the air conditioning units connected to M-NET
2) Interlocks the operation of air conditioning units and external devices that are connected to ALPHA2
3) Controls air conditioning units that are connected to M-NET
4) Allows for the combined use of items 1)-3) above
5) Monitors the input/output status of ALPHA2 via a remote controller or a centralized controller

Compatible controllers
- Remote Controller: PAR-U01MEDU, PAR-U02MEDA
- Centralized Controller: AE-200, AE-50, EW-50

* Refer to the manual that came with ALPHA2 for information about ALPHA2.
* Use of the AHC ADAPTER requires either a remote controller or a centralized controller.

■External Dimensions



⚠CAUTION	Usage Restrictions • This manual contains explanations and figures to help the user to properly install, program, and operate AHC. • All the examples and figures contained in this manual are there for the sole purpose of clarification. It is not guaranteed that AHC will properly work in the types of applications used as examples or are shown in figures. MITSUBISHI ELECTRIC shall not be held responsible for any damage or loss that may result from the use of AHC in the manners shown in the examples and figures contained in this manual. • Thoroughly read the technical manual, and check the surrounding for safety before changing the settings of AHC in operation (e.g., changing programs or parameters, forcing signal output, or changing the operation status).

CONTROLLER

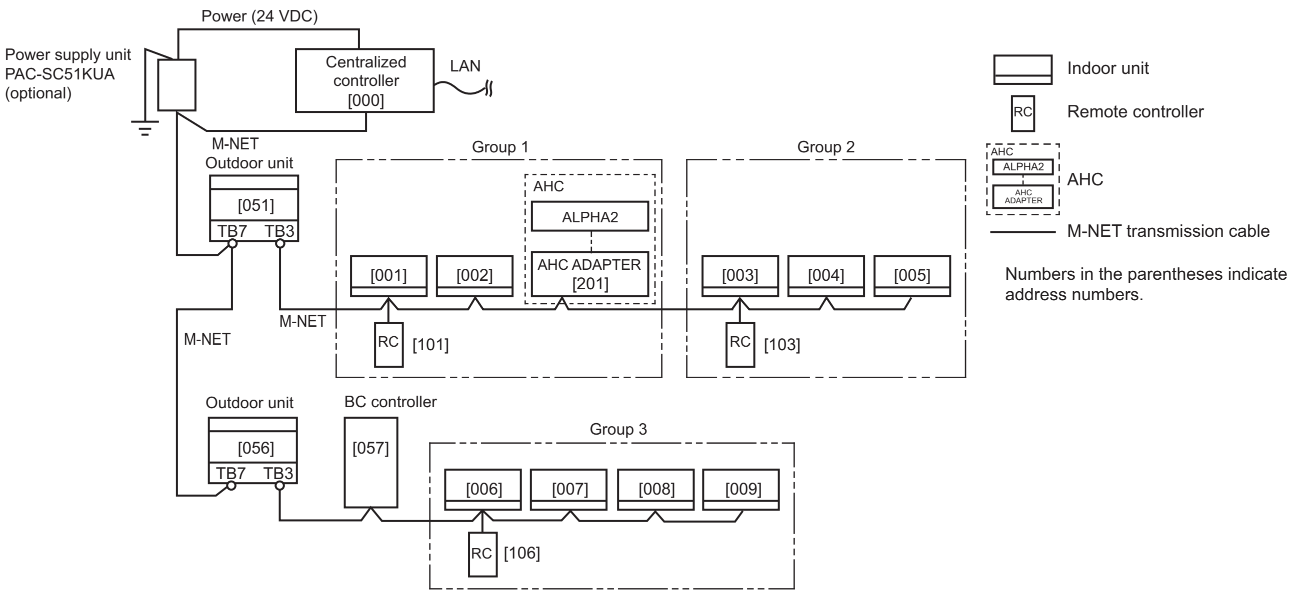
1. Specifications

(1) Device specifications

Item			Specifications
Power supply	M-NET		17–32 VDC
Interface	M-NET transmission terminal		Exclusively for connection to M-NET
	Connector for ALPHA2		Exclusively for connection to ALPHA2
Ambient conditions	Temperature	Operating temperature range	-10°C – +55°C [+14°F – +131°F]
		Storage temperature range	-20°C – +60°C [-4°F – +140°F]
	Humidity		30%–90% RH (Non-condensing)
Dimensions (W × H × D)			116 × 90 × 40 mm [4-9/16 × 3-1/2 × 1-9/16 in.]
Weight			0.4 kg [0.9lbs]
Installation conditions			Inside the metal control box * To be used in a business office or similar environment

1) System configuration

The figure below only shows the transmission cable connections. Power cables are omitted.



* AHC ADAPTER requires either an outdoor unit or a power supply device as a power source.

2) Functions

AHC comprises of an ALPHA2 and an AHC ADAPTER. The use of AHC ADAPTER requires the use of ALPHA2.

The following ALPHA2 are compatible with AHC. Other types of ALPHA2 do not support AHC.

- AL2-14MR-A
- AL2-14MR-D
- AL2-24MR-A
- AL2-24MR-D

Compatible controllers

- Remote Controller: PAR-U01MEDU, PAR-U02MEDA
- Centralized Controller: AE-200, AE-50, EW-50

AHC enables the connection of M-NET with other systems, which was not possible with the use of ALPHA2 alone.
AHC supports the functions listed in Table 1.

Table 1 AHC function list

AHC function	Example	Supplemental Inf.
1) Controls external devices using the sensor data of the air conditioning unitsconnected to M-NET.	● External heaters are controlled, using the temperature sensors on air conditioning units or on remote controllers.	By using the sensor on the air conditioning unit connected to the M-NET, no other external sensors will be required.*1
2) Interlocks the operation of air conditioning units and external devices that are connected to ALPHA2.	● The operation of external heaters is interlocked with the operation of air conditioning units in heating operation. ● The operation of external humidifiers is interlocked with up to 16 air conditioning units. Humidifiers will go into operation whenever at least one air conditioning unit is in operation.	Operation status data of a maximum of 2 groups of units can be simultaneously collected. Each group can contain a maximum of 16 units. Error status of a maximum of 50 units can be simultaneously collected.
3) Controls air conditioning units that are connected to M-NET.	● The ON/OFF operation of air conditioning units is interlocked with the insertion/removal of a card into or out of a card reader.	A maximum of 2 groups of units can be simultaneously controlled. Each group can contain a maximum of 16 units.
4) Allows for the combined use of the items 1)-3) above.	● Drying operation of air conditioning units is controlled, using the built-in humidity sensor on the remote controller.	
5) Monitors the input/output status of ALPHA2 via a remote controller or a centralized controller.		

*1 The sensor on the air conditioning unit connected to the M-NET will collect data at 70-second intervals. If a real time control at intervals shorter than 70 seconds is required, connect a sensor to the Analog Input on ALPHA2.

Note: For detailed information about the functions supported by AHC, refer to the technical manual that came with the AHC.

(2) Field-supplied items

The following items are required to install AHC ADAPTER.
* Two types of installation options (A and B in the table below) are available for AHC ADAPTER. Select the one that is best suited for a given environment.

Field-supplied items		Specifications
A	Unit fixing screw (required when using L-fittings)	M4 x 2 pcs.
B	DIN rail and fixing screw (required when using DIN rails)	DIN rail width: 35 mm (1-13/32 in) Applicable type (IEC 60715/DIN 60715): TH35-7.5Fe, TH35-7.5Al
Functional ground wire		* Use a wire with an appropriate diameter so that the wire can be fixed with the cable strap below the terminal block. A diameter of 10 mm is recommended.
Sleeved ring terminal		M3.5 ring terminal (for M-NET transmission cables (A, B, S)) M4 ring terminal (for functional ground wire)
Transmission cable		● CVVS Min. 1.25 mm² (Min. AWG 16) * CPEVS: PE*1 insulated PVC*1 sheathed shielded communication cable * CVVS: PVC*1 insulated PVC*1 sheathed shielded control cable * Use cables with an appropriate diameter so that the cables can be fixed with the cable strap below the terminal block. A diameter of 10 mm is recommended.

*1 PE: Polyethylene; PVC: Polyvinyl chloride

[Parts to be Purchased Separately]

Name	Model	Application	Remark
Power supply unit	PAC-SC51KUA	Power supply to the M-NET transmission line	This is not required when power is to be supplied from an outdoor unit.

[ALPHA2 components]

Name	Model	Power source specification	Optional module (Note 1)	Number of ports: Digital Input (DI)	Analog Input (AI)(Note 2)	Digital Output (DO)	Analog Output (AO)(Note 2)	Remark
ALPHA2	AL2-14MR-D	Requires a separate 24 VDC power source.	-	8	(8)*	6	-	
			AL2-4EX	12	(8)*	6	-	
			AL2-4EYT or AL2-4EYR	8	(8)*	10	-	
			AL2-2DA	8	(8)*	6	2	
	AL2-24MR-D	Requires a separate 24 VDC power source.	-	15	(8)*	9	-	
			AL2-4EX	19	(8)*	9	-	
			AL2-4EYT orAL2-4EYR	15	(8)*	13	-	
			AL2-2DA	15	(8)*	9	2	
	AL2-14MR-A	Requires a separate 100-240 VAC power source.	-	8	-	6	-	
			AL2-4EX-A2	12	-	6	-	
			AL2-4EYR	8	-	10	-	
	AL2-24MR-A	Requires a separate 100-240 VAC power source.	-	15	-	9	-	
			AL2-4EX-A2	19	-	9	-	
			AL2-4EYR	15	-	13	-	

* The AI ports for the DC type are shared by DI, with a maximum number of 8 AI ports.
* AI and AO cannot be used with the AC type ALPHA2.

(Note 1) I/O Extension Module /Analog Expansion Module

I/O Extension module

- EI: Digital input extension module of ALPHA2. 4 digital input ports can be added.
  Type name: AL2-4EX-A2 (AC type) and AL2-4EX (DC type)
- EO: Digital output extension module of ALPHA2. 4 digital output ports can be added.
  Type name: AL2-4EYR (AC type) and AL2-4EYT (DC type)

Analog Expansion module

- AO: Analog output extension module of ALPHA2. 2 analog output ports can be used.
  Type name: AL2-2DA (DC type)

Only one of the above EI, EO, and AO can be used.

(Note 2) Analog signals that can be used for AI and AO of the DC type ALPHA2

- Analog Input (AI): 0-10V, PT100(*), thermocouple(*)

(*) To use a PT100 or thermocouple, a temperature sensor module is required separately.
Type name: AL2-2PT-ADP(Pt100 sensor), AL2-2TC-ADP(Thermocouple)
(Converts the Pt100/thermocouple to 0-10V)

- Analog Output (AO): 0-10V, 4-20mA

For details, refer to the ALPHA2 manuals (Installation Manual and Hardware Manual).

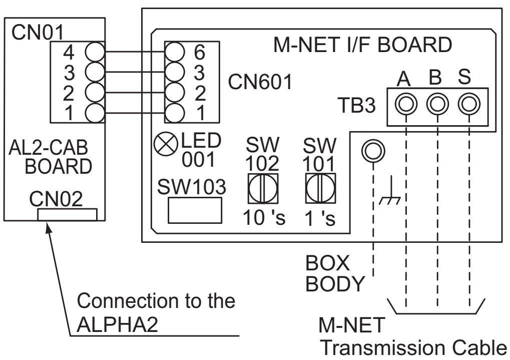
[Commercially available parts]

Name	Application	Remark
External 24 VDC power source	Supplies power to the ALPHA2 and/or Extension module.	Check to see if an external 24 VDC power source is required for a specific ALPHA2 and an Extension module.
Sensor	Measures temperature and humidity, etc.	Some sensors require additional parts.

For details, refer to the ALPHA2 manuals (Installation Manual and Hardware Manual).

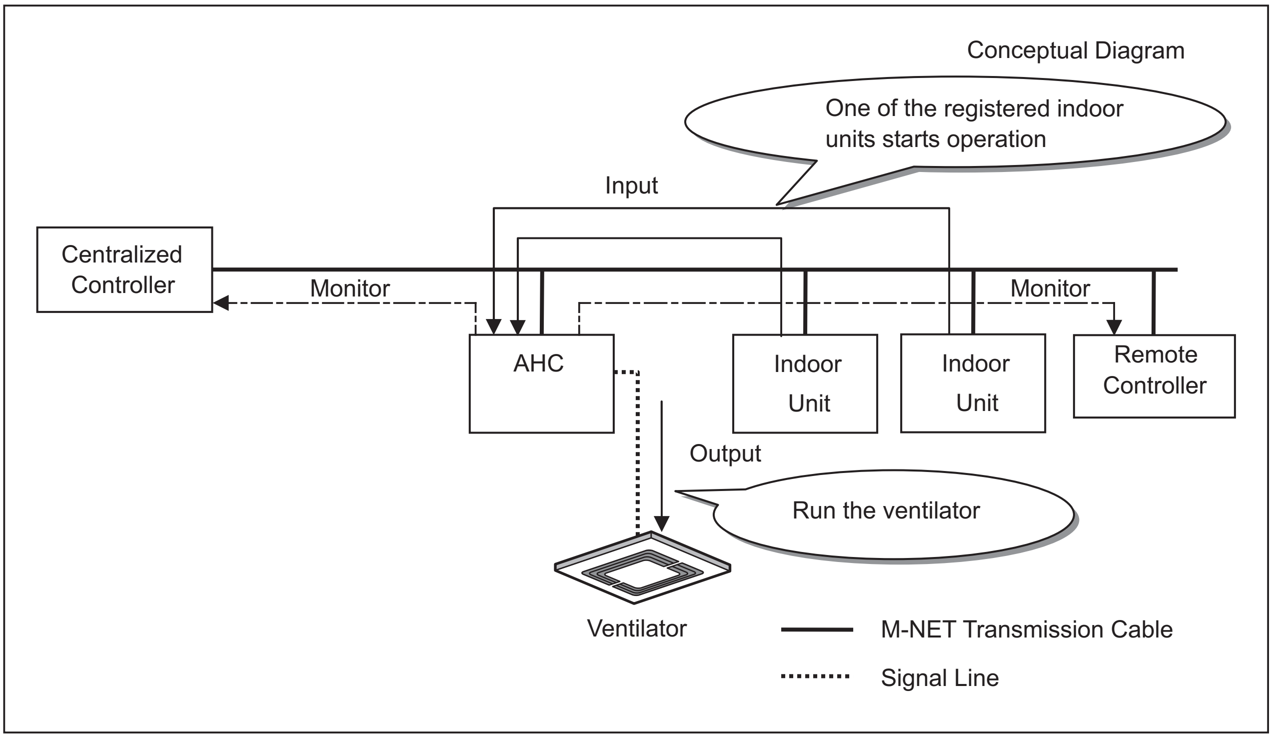
2. Wiring Instructions

Connecting the Power and M-NET Transmission Cable.

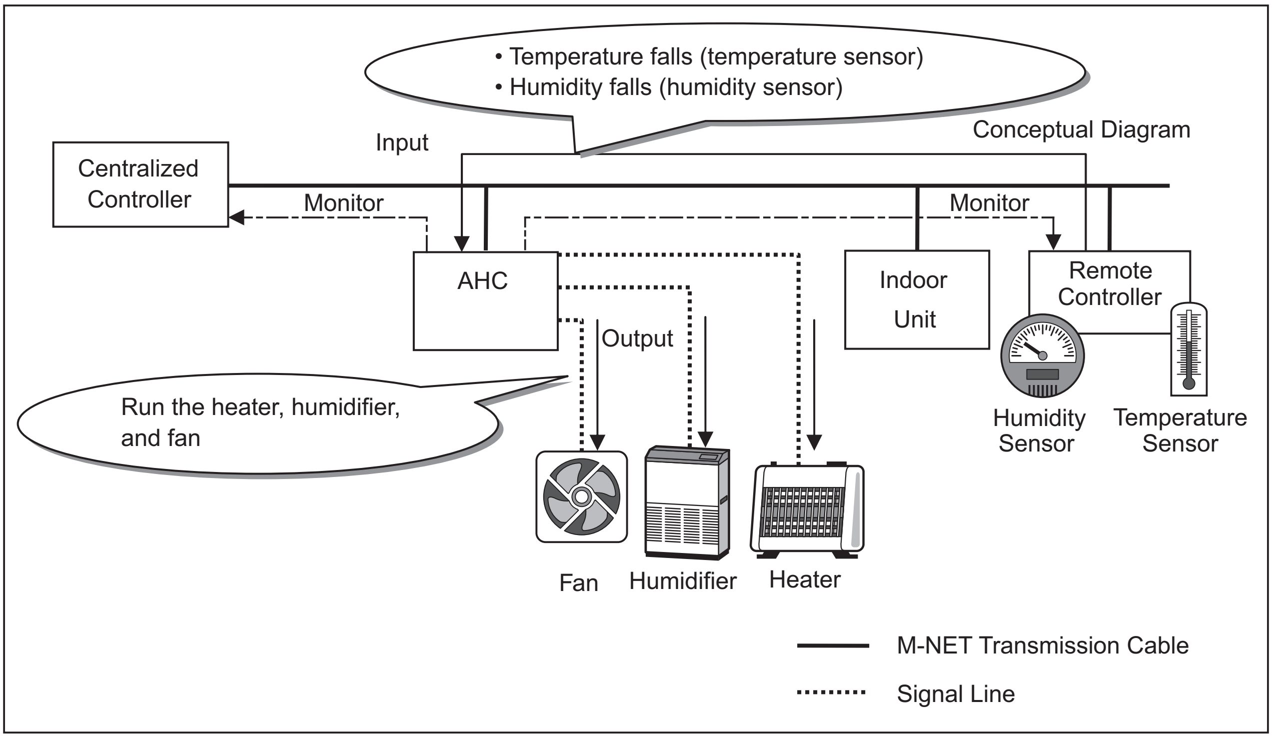


3. Combination and Application Example of the Inuput Information and Equipment Items

Interlocking with the external Ventilator Using the Start and Stop Information of Multiple Air Conditioners



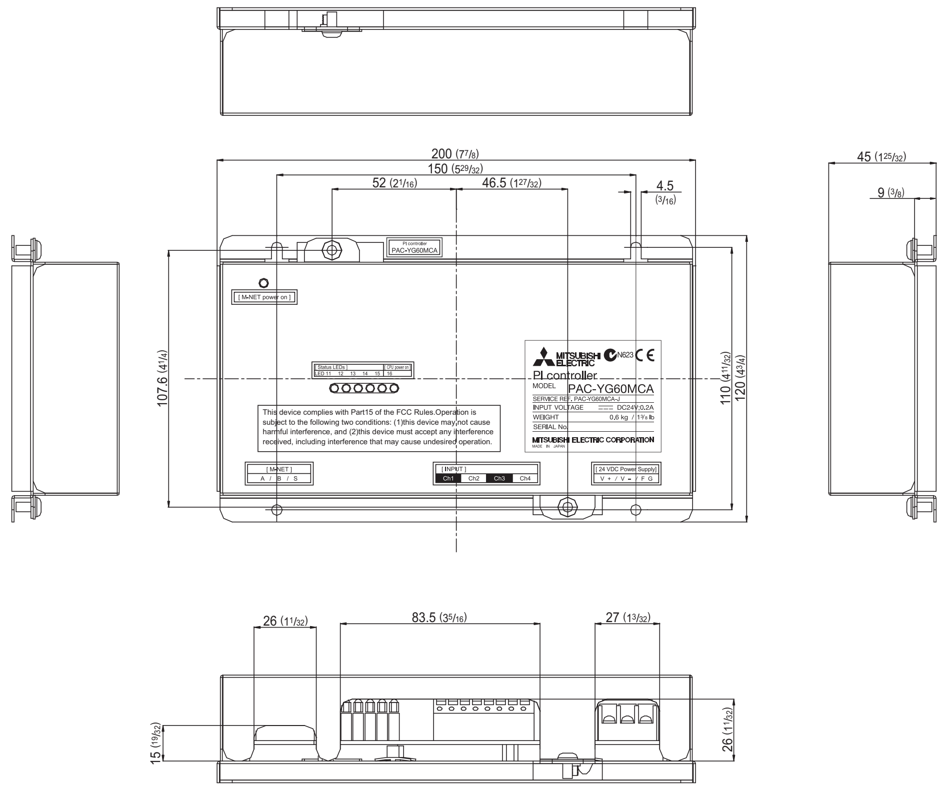
Interlocking the Heater, Humidifier, and Fan



3-10. PI controller [PAC-YG60MCA]

The PI controller counts pulses from a power meter, gas meter, water meter, and calorimeter.
Combining the use of the AE-200A/AE-50A/AG-150A-A/EW-50A/EB-50GU-A and TG-2000A allows for calculating the charges for each unit and performing peak-cut (e.g., demand control) operation.
The meters can be monitored on AG-150A-A LCD.

■External Dimensions



Unit: mm (in)

⚠CAUTION

Usage Restrictions

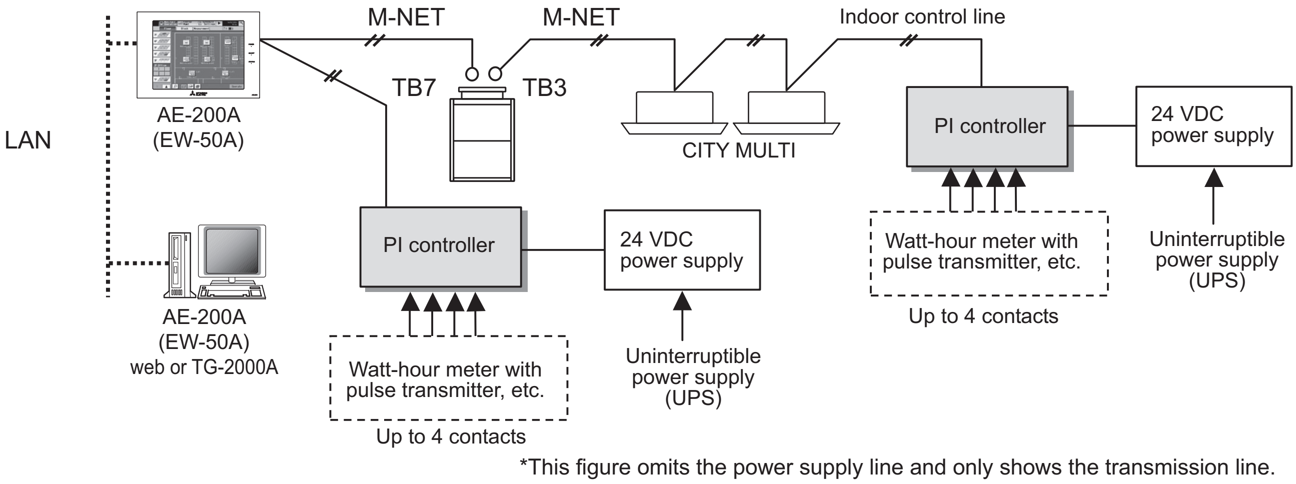
- Mitsubishi Electric does not take financial responsibility for damages caused by issues beyond our control or special circumstances (predicable or unpredictable); and secondary or accidental damages, and damages to other objects. We also do not take financial responsibility for opportunities lost as a result of device failure, or electrical power failure at the end-user site.
  Mitsubishi Electric does not take financial responsibility caused by end-users' requests including, but not limited to, device testing, startup, readjustment, and replacement.
- Because the PI controller only counts pulses, accuracy and performance of pulse conversion depend on the meter.
  Mitsubishi Electric does not take financial responsibility for damages caused by issues beyond our control or special circumstances (predicable or unpredictable); and secondary or accidental damages and damages to other object.
- Depending on each country's laws and regulations, etc., there may be cases these measured charges cannot be used for certificate of transaction.

1. Specifications

(1). Device Specifications

Item	Rating and Specification			
Power Supply	24 VDC ±10%: 5 W			Screw terminal block (M3) (*3)
Interface	M-NET communication	17 to 30 VDC (*1)		Screw terminal block (M3) (*3)
	Non-voltage a-contact input	Number of contacts: 4 Pulse signal: a-contact Pulse width: 100 ms to 300 ms (Idle period until next pulse: 100 ms or more) 100 ms or more 100 ms ~ 300 ms Rated voltage: 24 VDC Rated current: 1 mA or less (*2)		Screwless terminal block
Environment Conditions	Temperature	Operating temperature range	0 to 40°C [32°F to 104°F]	
		Storage temperature range	-20 to 60°C [-4°F to 140°F]	
	Humidity	30 to 90%RH (no condensation)		
Dimensions	200 (W) × 120 (H) × 45 (D) mm / 7 7/8 (W) × 4 3/4 (H) × 1 25/32 (D) in			
Weight	0.6 kg / 1 3/8 lb			
Time Backup During Power Failure	In the event of power failure or shut-off, the internal capacitor will continue to track time for approximately one week. (The internal capacitor takes about 24 hours to fully charge; a replacement battery is not necessary.)			
Installation Environment	Inside the metal control board (indoors) * Use this product in a hotel, a business office environment or similar environment.			

*1: Supply electric power from a power unit for the transmission line or an outdoor unit. Furthermore, the power consumption factor of the M-NET circuitry of this device is"1/4".
*2: Supply electric power from the main unit to the contacts of the meters.
*3: M3 is the size of the screw on the terminal block (ISO metric screw thread). The number indicates the screw diameter (mm).



*This figure omits the power supply line and only shows the transmission line.

<Restrictions>

Although the maximum settable total number of built-in PI controllers and PI controllers (PAC-YG60MCA) for each AE-200A/AE-50A/EW-50A is 15, the number of them in a system with connection to one or more AE-50A/EW-50A controllers must be 20 or less. (Each built-in PI controllers counts as one unit.)
Maximum of 15 units (total 60 channels) per EB-50GU-A/AG-150A-A (Expansion controller) ver. 2.45 or later
However, the number of units that can be connected to one AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A is up to 50 including this device, indoor units, Lossnay units, etc.

NOTE	• For the shield ground of the M-NET centralized control line for central control, use single-point grounding at the power unit for the transmission line. However, when supplying electric power to the M-NET centralized control line from the R410A-Series outdoor unit*1 without using a power supply unit for the transmission line, use single-point grounding at the TB7 of that outdoor unit. *1 : Except PUMY model and PUHY/PURY-TLMU/TKMU model (Y/R2/H2i R2-Series) Furthermore, when connecting this device to the M-NET indoor control line, use grounding at the TB3 for each outdoor unit system. • Connecting an Uninterruptible power supply (UPS) to the 24 VDC power supply is recommended in order to prevent the loss of pulse data in the event of a power failure. If a UPS cannot be connected, try to make the AC power supply to the 24 VDC power supply as much same as the AC power supply line to the meters. • This device does not support level meters. To use a level meter, incorporate a Converter circuit externally and convert to pulse input. • If the M-NET transmission line of this device is connected to an M-NET indoor control line and the outdoor unit is down because, for example, the power supply is interrupted for servicing or there is a failure, the PI controller cannot be controlled from the system controller.

(2). Parts Purchased Separately

Prepare the following parts to install this device.

Required Part	Specification
Unit fixing screws	M4 screw × 4 (* M4: ISO metric screw thread)
Power supply for this device	Power source: 24 VDC 0.2 A (Minimum loading), SELV circuit, power line with grounding terminal Ripple noise: Lower than 200 mVp-p Compatible specification Authorized or CE marked products Subject to regulations: - IEC60950 (or EN60950) - CISPR22/24 (or EN55022/24) - IEC61000-3-2/3-3 (or EN61000-3-2/3-3)
Power line	Use a sheathed vinyl cord or cable. At least 0.75 mm^2 (AWG18)
M-NET transmission line	Type of the cable: Sheathed vinyl cords or cable which comply with the following specifications or equivalent. • CPEV ø1.2 mm to ø1.6 mm • CVVS 1.25 mm^2 to 2 mm^2 (AWG16 to 14) * CPEV: PE insulated PVC sheathed shielded communication cable * CVVS: PVC insulated PVC sheathed shielded control cable PE: Polyethylene PVC: Polyvinyl choloride Power needs to be supplied to the M-NET circuitry of this device. Use an outdoor unit or a separately purchased power supply unit for the transmission line.
Signal lines	Shows the size of the electric wire (copper wire) that is adapted to the terminal block of this device. Electric wire size................. (1)Solid wire: ø0.65 mm (AWG21) - ø1.2 mm (AWG16) (2)Stranded wire: 0.75 mm^2 (AWG18) - 1.25 mm^2 (AWG16) Single strand: At least ø0.18 mm

[Parts to be Purchased Separately]

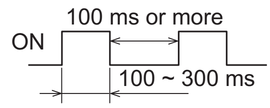
Name	Model	Application	Remark
Power supply unit	PAC-SC51KUA	Power supply to the M-NET transmission line	This is not required when power is to be supplied from an outdoor unit.

[Commercially available parts]

Part	Use	Remark
External 24 VDC power source	Supplies power to the PI controller.	Refer to "Power supply for this device" in "Required Part" above for the capacity of the power supply.

[Recommended Pulse Specifications]

Prepare a measuring instrument that measures the type of pulse signals indicated in table below.

Type	Specification
Output pulse relay method	Semiconductor relay method
Output pulse width	100 ~ 300 ms (100 ms and above) Choose an instrument that outputs non-voltage a-contact point pulse per each pulse output. 
Pulse unit	Watt-hour meter: 0.1 kWh/pulse, 1 kWh/pulse recommended Water meter: m^3/pulse Gas meter: m^3/pulse Calorimeter: MJ/pulse * Except for the watt-hour meter, select instruments that take measurements in the appropriate pulse unit.

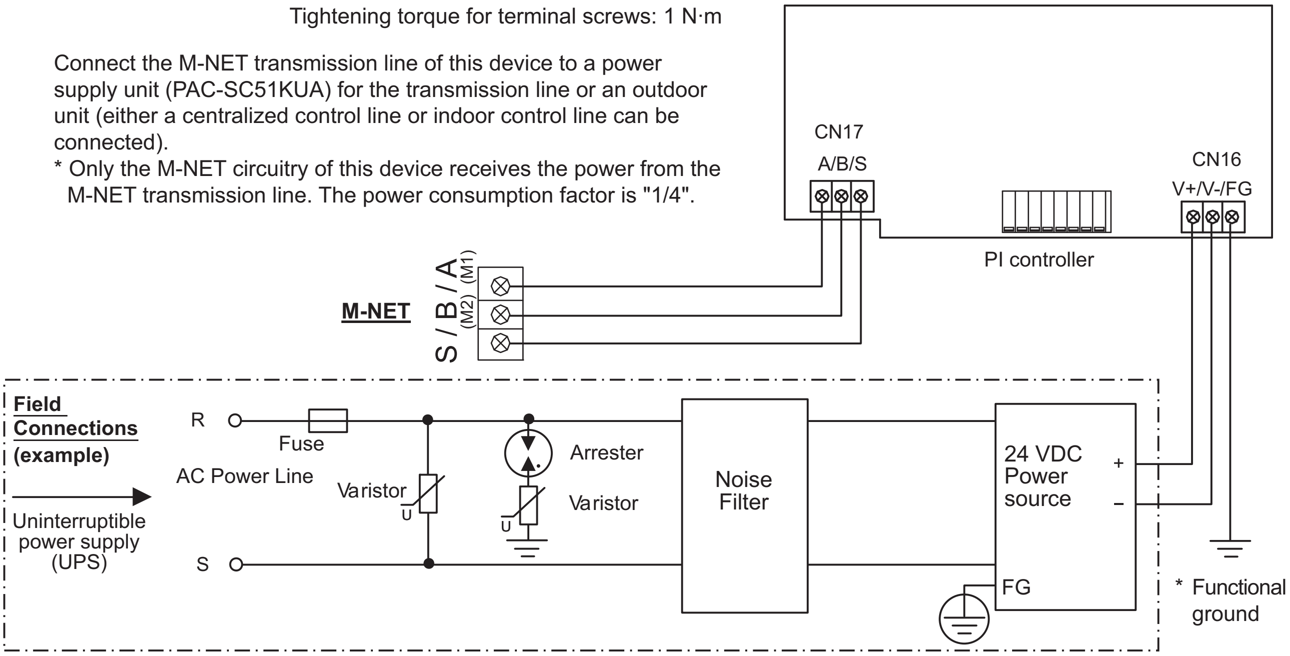
2. Wiring Instructions

(1). Connecting the Power and M-NET Transmission Lines

Tightening torque for terminal screws: 1 N·m

Connect the M-NET transmission line of this device to a power supply unit (PAC-SC51KUA) for the transmission line or an outdoor unit (either a centralized control line or indoor control line can be connected).

* Only the M-NET circuitry of this device receives the power from the M-NET transmission line. The power consumption factor is "1/4".

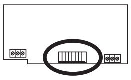


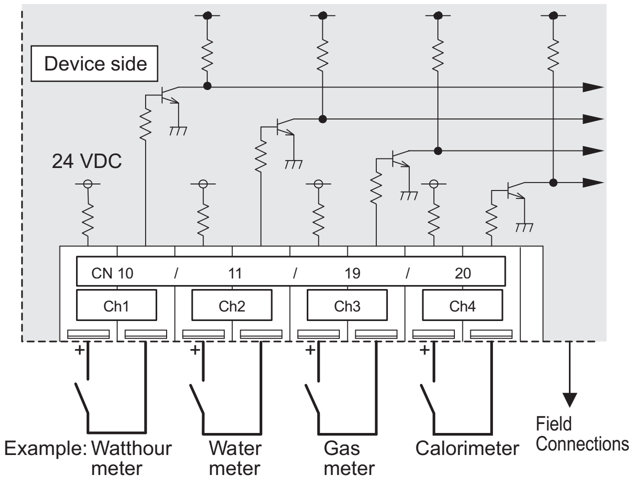
⚠CAUTION	• Use a power line and M-NET transmission line that satisfy the specifications described in "1-(2). Parts Purchased Separately". • Attach a circuit comprising the following components to the supply primary side of the 24 VDC power supply. (1) Varistor, (2) Arrester, (3) Noise filter, (4) Fuse • It is important to pay attention to the polarity when connecting to the 24 VDC power supply terminal block. Connecting the positive and negative in the reverse order will cause a failure. • Fix the power line and M-NET transmission line in place on the outside to ensure that the terminal block is not affected by any external force. Not securely connecting and fixing the wires in place may cause heat generation and fire. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. Cover the shielded line of the M-NET transmission line with materials such as vinyl tape and prevent short-circuiting with the plates.

(2). Connecting the Signal Lines

- Separately procure items such as terminal blocks and cables locally.
- The maximum wire length is 100 m (328 ft).
  However, since the use of long wires makes the device susceptible to noise, using wires shorter than 10 m (32.8 ft) is recommended.

1) Pulse input (non-voltage a-contact)





NOTE	• The pulse unit (weight) can be added to each of the inputs of channels 1 to 4. • Be sure to set the pulse unit (weight) settings from a system controller (AE-200A/AE-50A/EW-50A/AG-150A-A/ EB-50GU-A or TG-2000A). If the pulse unit (weight) value has not been set as required, the charge function and peak cut control will not work normally because correct measurement of usage amounts will not be made. • This device does not support level meters. To use a level meter, incorporate a Converter circuit externally and convert to pulse input.

⚠CAUTION	• The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity. • Select a contact with a minimum applicable load of 1 mA or less. • Supply 24 VDC 1 mA from the positive terminal to the contacts of the meters. • The pulse unit of the watt-hour meter being used should be 1 kWh/pulse or less. Note that the apportioning error will increase if a watt-hour meter with large pulse unit is used. • The input signal line should not come into contact with or be installed alongside the M-NET transmission line and power supply line. Care must also be taken to avoid wiring loops. • Strip 12±1 mm (15/32 ± 1/32 in) of the wire coating and insert firmly into the terminal. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. • Perform wiring so that the terminal block is not strained. If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block.

3. System Operation Test

Various settings related to the charge operation need to be configured from the TG-2000A prior to starting the charge function operation. Furthermore, in such a case, be sure to perform a charge test run according to the instruction manual for TG-2000A.

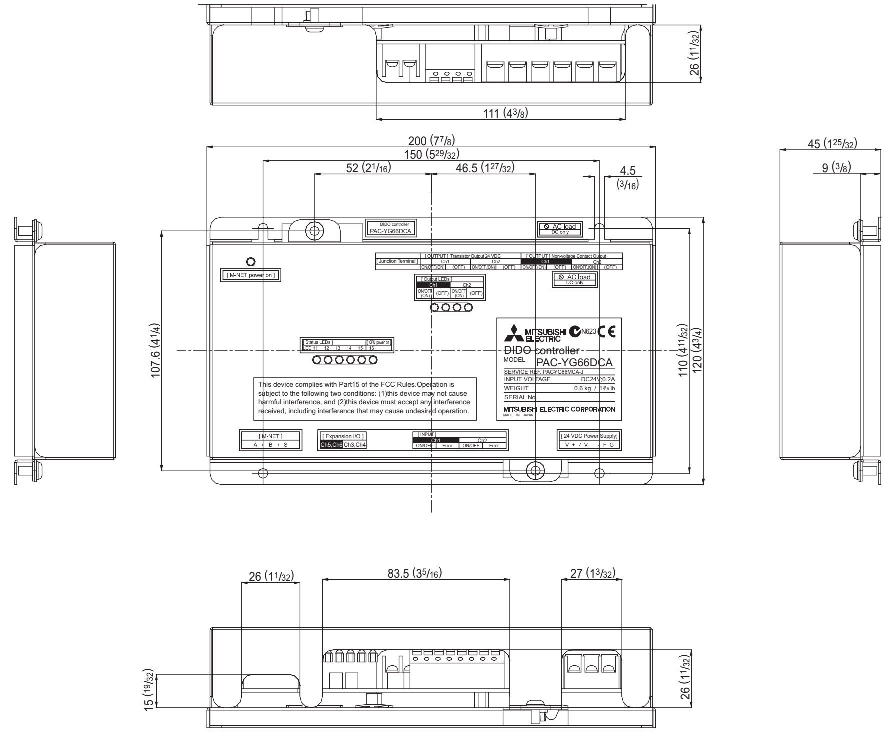
Do not turn the power OFF after starting operation. The power rate will not be counted while the power interruption.
Forcible pulse input must never be carried out after startup.

3-11. DIDO controller [PAC-YG66DCA]

The DIDO controller is used in combination with a AE-200A/AE-50A/AG-150A-A/EW-50A/EB-50GU-A to operate general-purpose equipment, as well as to monitor operating and error status. It is equipped with two sets of standard terminals (Channels 1 and 2), and four sets of expansion connectors for the input/output terminals. Expansion cable is optional.

Operation can be monitored or performed from the AG-150A-A LCD.
In addition, this device includes a function that interlocks M-NET devices such as indoor units, general equipment, etc.

■External Dimensions



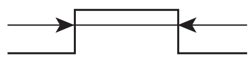
Unit: mm (in)

⚠CAUTION	Usage Restrictions • Mitsubishi Electric does not take financial responsibility for damages caused by issues beyond our control or special circumstances (predicable or unpredictable); and secondary or accidental damages, and damages to other objects. We also do not take financial responsibility for opportunities lost as a result of device failure, or electrical power failure at the end-user site. Mitsubishi Electric does not take financial responsibility caused by end-users' requests including, but not limited to, device testing, startup, readjustment, and replacement. • Do not use this device in disaster prevention, security, or "critical to life" applications. • It is recommended to provide an external switch for general-purpose equipment in case of a failure of the DIDO controller or a peripheral part.

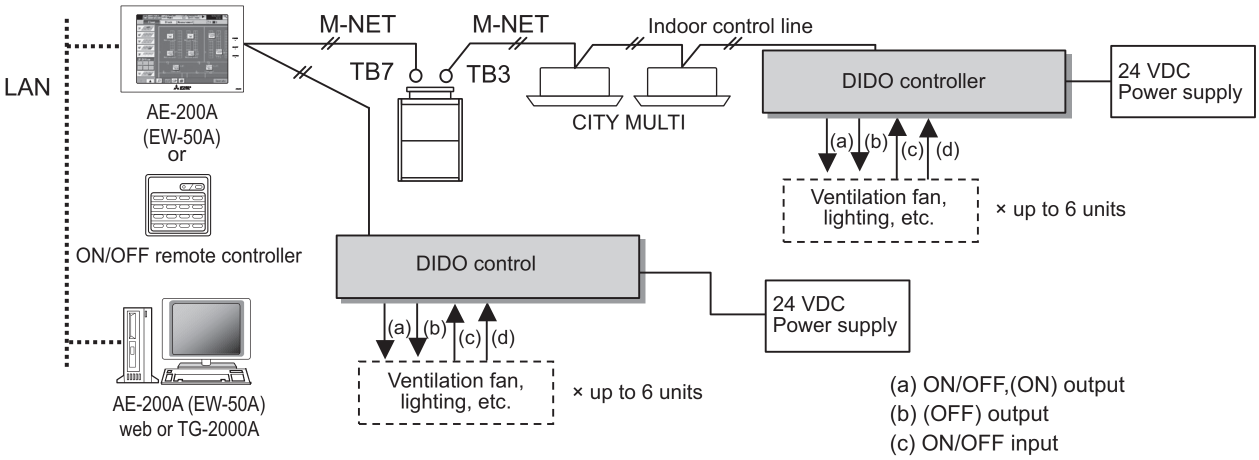
CONTROLLER

1. Specifications

(1). Device Specifications

Item	Rating and Specification					
Power Supply	24 VDC ±10%: 5 W (*1)					Screw terminal block (M3) (*8)
Interface	M-NET communication			17 to 30 VDC (*2)		Screw terminal block (M3) (*8)
	Standard	Output (*3)	ON/OFF, (ON) (*4)	Non-voltage Relay contact (2)	Applied load MAX: 24 VDC, 5 W MIN: 5 VDC, 2 mW * AC loads cannot be connected.	Screw terminal block (M3.5) (*8)
				Transistor (2)	24 VDC 40 mA or less (*5)	Screwless terminal block
			(OFF) (*4)	Non-voltage Relay contact (2)	Applied load MAX: 24 VDC, 5 W MIN: 5 VDC, 2 mW * AC loads cannot be connected.	Screw terminal block (M3.5) (*8)
				Transistor (2)	24 VDC 40 mA or less (*5)	Screwless terminal block
		Input	ON/OFF Error/Normal	Non-voltage a contact (2 each)	24 VDC 1 mA or less (*6)	Screwless terminal block
	Expansion	Output	ON/OFF, (ON) (*4) (OFF) (*4)	Transistor (4 each)	24 VDC 40 mA or less (*5)	9 pin connector
		Input	ON/OFF Error/Normal	24 VDC input (4 each)	24 VDC 1 mA or less (*7)	9 pin connector
	Output Pulse Width			1s ± 30 ms	 1s ±30 ms	
Interlock Function	Interlock M-NET devices and output contacts according to status of input contacts. (*8)					
Environment Conditions	Temperature			Operating temperature range	0 to 40°C[32°F to 104°F]	
				Storage temperature range	-20 to 60°C[-4°F to 140°F]	
	Humidity			30 to 90%RH (no condensation)		
Dimensions	200 (W) × 120 (H) × 45 (D) mm / 7 7/8 (W) × 4 3/4 (H) × 1 25/32 (D) in					
Weight	0.6 kg / 1 3/8 lbs					
Time Backup During Power Failure	In the event of power failure or shut-off, the internal capacitor will continue to track time for approximately one week. (The internal capacitor takes about 24 hours to fully charge; a replacement battery is not necessary.)					
Installation Environment	Inside the metal control board (indoors) * Use this product in a hotel, a business office environment or similar environment.					

*1: For details, refer to "1-(2). Parts Purchased Separately".
*2: Supply electric power from a power unit for the transmission line or an outdoor unit.
Furthermore, the power consumption factor of the M-NET circuitry of this device is "1/4".
*3: Non-voltage Relay contact or transistor is available for output. Only one can be used at a time.
*4: ( ) is in the case of a pulse.
*5: The output is open collector type. Power must be supplied from an external power source to the output circuit of this device.
*6: Power is supplied from this device to the external contacts.
*7: Power must be supplied from an external power source.
*8: M3 and M3.5 are sizes of the screw on the terminal block (ISO metric screw thread).
The number indicates the screw diameter (mm).



*This figure omits the power supply line and only shows the transmission line.

(a) ON/OFF,(ON) output
(b) (OFF) output
(c) ON/OFF input
(d) Error/Normal input
Standard: Terminal block (for 2 units)
Expansion: Connectors (for 4 units)
Total: 6 units

<Restrictions>
Maximum of 50 units (50 channels) per AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A
However, the number of units that can be connected to a AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A is up to 50 including the number of contacts used on this device, an indoor unit, Lossnay unit, etc.
Up to 6 contacts can be connected to the DIDO controller (1 M-NET address). One contact connected to this device is calculated as the equivalent of one indoor unit connected to AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A.
For example, 5 contacts connected to the DIDO controller are calculated as the equivalent of 5 indoor units connected to AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A.

NOTE	•For the shield ground of the M-NET centralized control line, use single-point grounding at the power unit for the transmission line. However, when supplying electric power to the M-NET centralized control line from the R410A-Series outdoor unit[*1] without using a power supply unit for the transmission line, use single-point grounding at the TB7 of that outdoor unit. *1: Except PUMY model and PUHY/PURY-T(S)LMU/T(S)KMU model (Y/R2/H2i R2-Series) Furthermore, when connecting this device to the M-NET indoor control line, use grounding at the TB3 for each outdoor unit system. •If the M-NET transmission line of this device is connected to the M-NET indoor control line and the outdoor unit is down because, for example, the power supply is interrupted for servicing or there is a failure, the DIDO controller cannot be controlled from the system controller. •Controlling the ON/OFF remote controller is only possible with channel 1 of a standard terminal block. • When AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A is connected, monitoring control can only be performed from AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A or TG-2000A. Monitoring control cannot be performed from the ON/OFF remote controller.

(2). Parts Purchased Separately

Prepare the following parts to install this device.

Required Part	Specification
Unit fixing screws	M4 screw × 4 (*M4: ISO metric screw thread)
Power supply for this device	Commercially available power source: 24 VDC±10% 0.2 A (Minimum loading), SELV circuit, power line with grounding terminal Ripple noise: Lower than 200 mVp-p Compatible specification Authorized or CE marked products Subject to regulations: - IEC60950 (or EN60950) - CISPR22/24 (or EN55022/24) - IEC61000-3-2/3-3 (or EN61000-3-2/3-3) When using transistor output (including extension output) for the 24 VDC output of this device, increase the capacity to match the number used. • 1 set used: 0.3 ADC (Minimum) • 2 sets used: 0.4 ADC (Minimum) • 3 sets used: 0.5 ADC (Minimum) • 4 sets used: 0.6 ADC (Minimum) • 5 sets used: 0.7 ADC (Minimum) • 6 sets used: 0.8 ADC (Minimum) * The increase of the power supply capacity is 0.1 ADC for every set.
Power line	Use a sheathed vinyl cord or cable. At least 0.75 mm^2 (AWG18)
M-NET transmission line	Type of the cable: Sheathed vinyl cords or cable which comply with the following specifications or equivalent. • CPEV ø1.2 mm to ø1.6 mm • CVVS 1.25 mm^2 to 2 mm^2 (AWG 16 to 14) * CPEV: PE insulated PVC sheathed shielded communication cable * CVVS: PVC insulated PVC sheathed shielded control cable PE: Polyethylene PVC: Polyvinyl choloride Power needs to be supplied to the M-NET circuitry of this device. Use an outdoor unit or a separately purchased power supply unit for the transmission line.
Signal lines	Use electric wire of an appropriate size for the terminal block of this device. Electric wire size ···· (1) Solid wire: ø0.65 mm (AWG21) - ø1.2 mm (AWG16) (2) Stranded wire: 0.75 mm^2 (AWG18) - 1.25 mm^2 (AWG16) Single strand: At least ø0.18 mm To use an expansion input/output, use a separately purchased external input/output adapter.

[Parts to be Purchased Separately]

Name	Model	Application	Remark
Power supply unit	PAC-SC51KUA	Power supply to the M-NET transmission line	This is not required when power is to be supplied from an outdoor unit.
External I/O adapter	PAC-YG10HA-E	Connection adapter for using an expansion input/output	This is required when an expansion input/output is used.

[Commercially available parts]

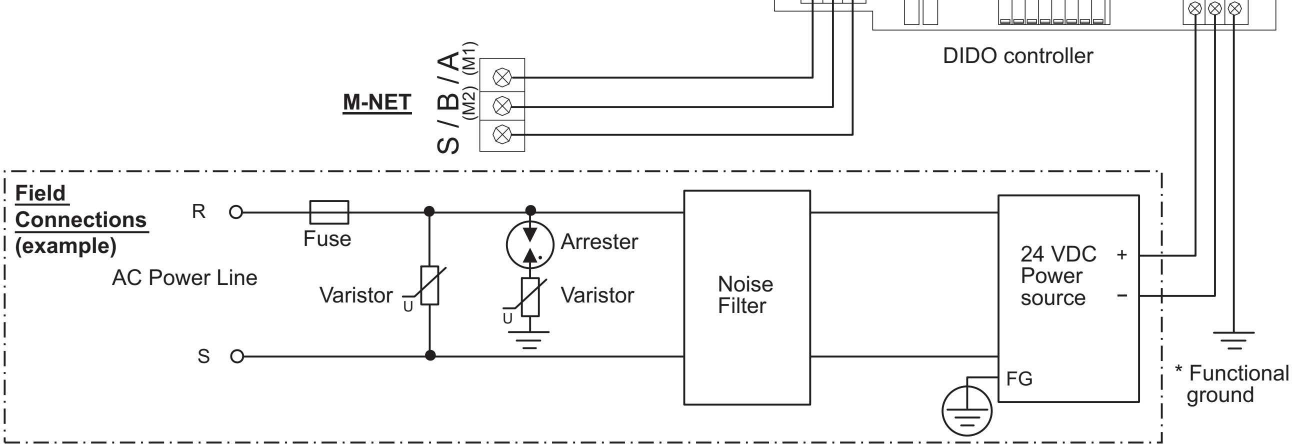
Name	Application	Remark
External 24 VDC power source	Supplies power when to use the DIDO controller or transistor output.	Refer to "Power supply for this device" in "Required Part" above for the power supply capacity.
Relay device	Requires commercially available relay device depending on the electric specifications with an external device.	

2. Wiring Instructions

(1). Connecting the Power and M-NET Transmission Lines

Tightening torque for terminal screws: 1 N·m

Connect the M-NET transmission line of this device to a power supply unit (PAC-SC51KUA) for the M-NET transmission line or an outdoor unit (either a centralized control line or indoor control line can be connected).
* Only the M-NET circuitry of this device receives the power from the M-NET transmission line. The power consumption factor is "1/4".



⚠CAUTION	• Use a power line and M-NET transmission line that satisfy the specifications described in "1-(2). Parts Purchased Separately". • Attach a circuit comprising the following components to the supply primary side of the 24 VDC power supply. (1) Varistor, (2) Arrester, (3) Noise filter, (4) Fuse • It is important to pay attention to the polarity when connecting to the 24 VDC power supply terminal block. Connecting the positive and negative in the reverse order will cause a failure. • Fix the power line and M-NET transmission line in place on the outside to ensure that the terminal block is not affected by any external force. Not securely connecting and fixing the wires in place may cause heat generation and fire. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. Cover the shielded line of the M-NET transmission line with materials such as vinyl tape and prevent short-circuiting with the plates.

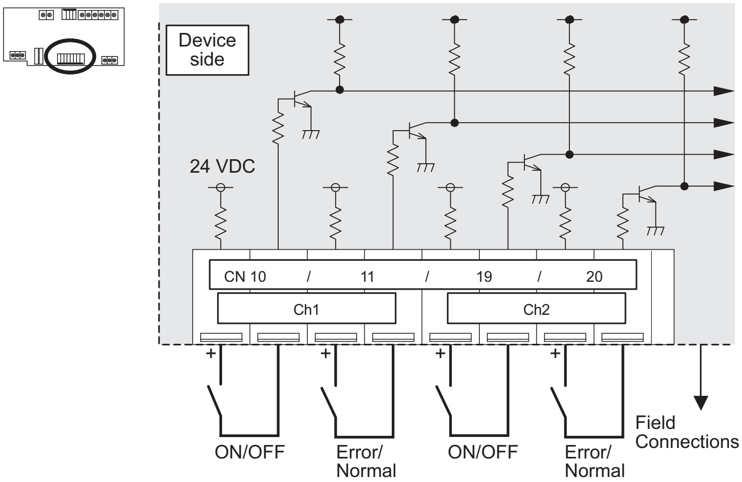
(2). Connecting the Signal Lines

- Separately procure the relay, power supply for the relay, terminal block, and cable locally.
- The maximum wire length is 100 m (328 ft). However, since the use of long wires makes the device susceptible to noise, using wires shorter than 10 m (32.8 ft) is recommended.
- Connect another relay within 10 m (32.8 ft) from DIDO controller to extend the input line.

1) Standard Terminals (Channels 1 and 2)

(1-1) Input

(a) Non-voltage a-contact Inputs



Contacts closed :
Operating (ON); detected an error
Contacts closed :
Operating (ON); detected an error
*Error/normal detection becomes inverted from contact open/closed logic for a b-contact setting.

NOTE	• Connect the operate/stop (ON/OFF) inputs so that closing the contact operates (ON) the device and opening the contact stops (OFF) the device. • The error/normal inputs of channels 1 and 2 can be switched between a-contact and b-contact.

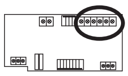
⚠ **CAUTION**	• The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity. • Select a contact with a minimum applicable load of 1 mADC or less. • Supply 24 VDC 1 mA from the positive terminal to the external contacts. • Do not install alongside or in contact with other wires. • Strip 12 ± 1 mm (15/32 ± 1/32 in) of the wire coating and insert firmly into the terminal. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. • Perform wiring so that the terminal block is not strained. If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block.

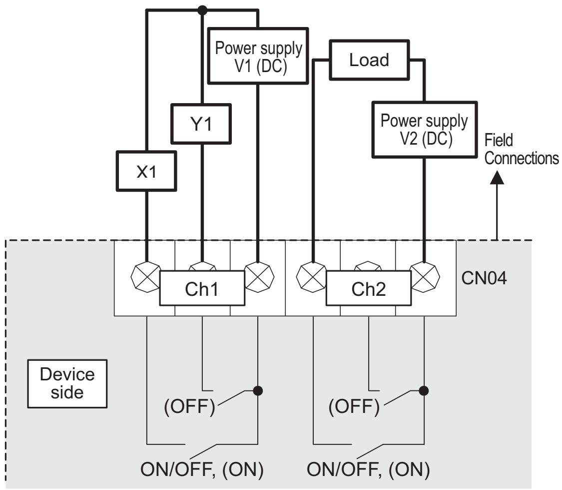
CONTROLLER

(1-2) Output

Non-voltage Relay contact or transistor is available for output. Only one can be used at a time.

(a) Non-voltage Relay Contact Outputs





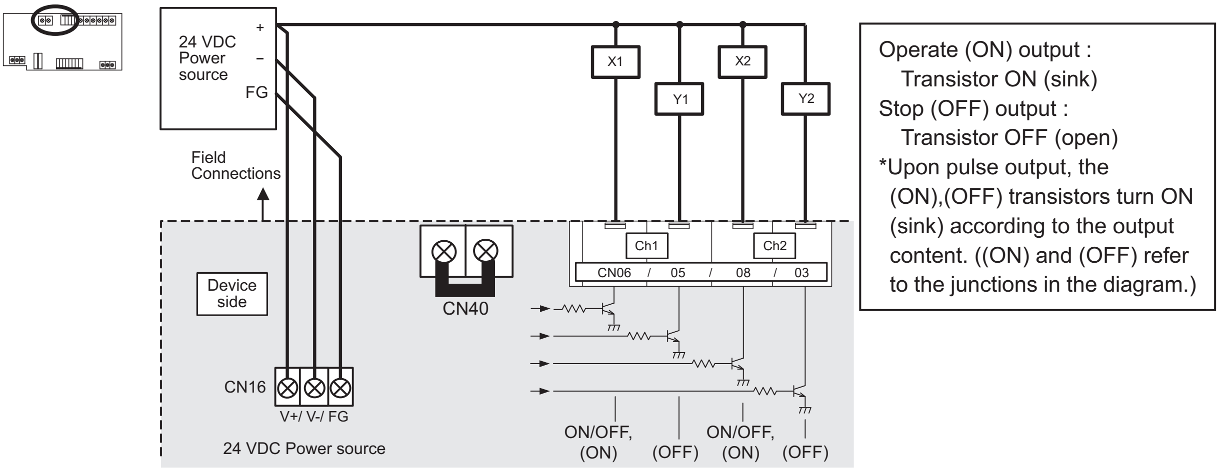
Operate (ON) output :
Contacts closed
Stop (OFF) output :
Contacts open
*Upon pulse output, the (ON), (OFF) contacts close according to the output content. ((ON) and (OFF) refer to the junctions in the diagram.)

( ) is in the case of a pulse.

Tightening torque for terminal screws: 1 N·m

⚠CAUTION	• To use X1 and Y1 relay, obtain one that satisfies the following specifications. Operating coil [Applied load] MAX: 24 VDC, 5 W (Built-in diode) MIN: 5 VDC, 2 mW (Built-in diode) *1 AC loads cannot be connected. *2 Provide a power supply (V1, V2) that matches the load and relay to be used. • To drive a direct load, use ones within the following. [Applied load] MAX: 24 VDC, 5 W MIN: 5 VDC, 2 mW * AC loads cannot be connected. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. • Perform wiring so that the terminal block is not strained. If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block. • Do not connect the wires directly from the top of the control panel to the terminal block. Moisture may enter this device along the wiring and cause electric shock or fire.

(b) Transistor Outputs (Open Collector)



( ) is in the case of a pulse.

Tightening torque for terminal screws: 1 N·m

NOTE	The junction terminal block CN40 (for 24 VDC) is provided. Use them as relay terminals if necessary.

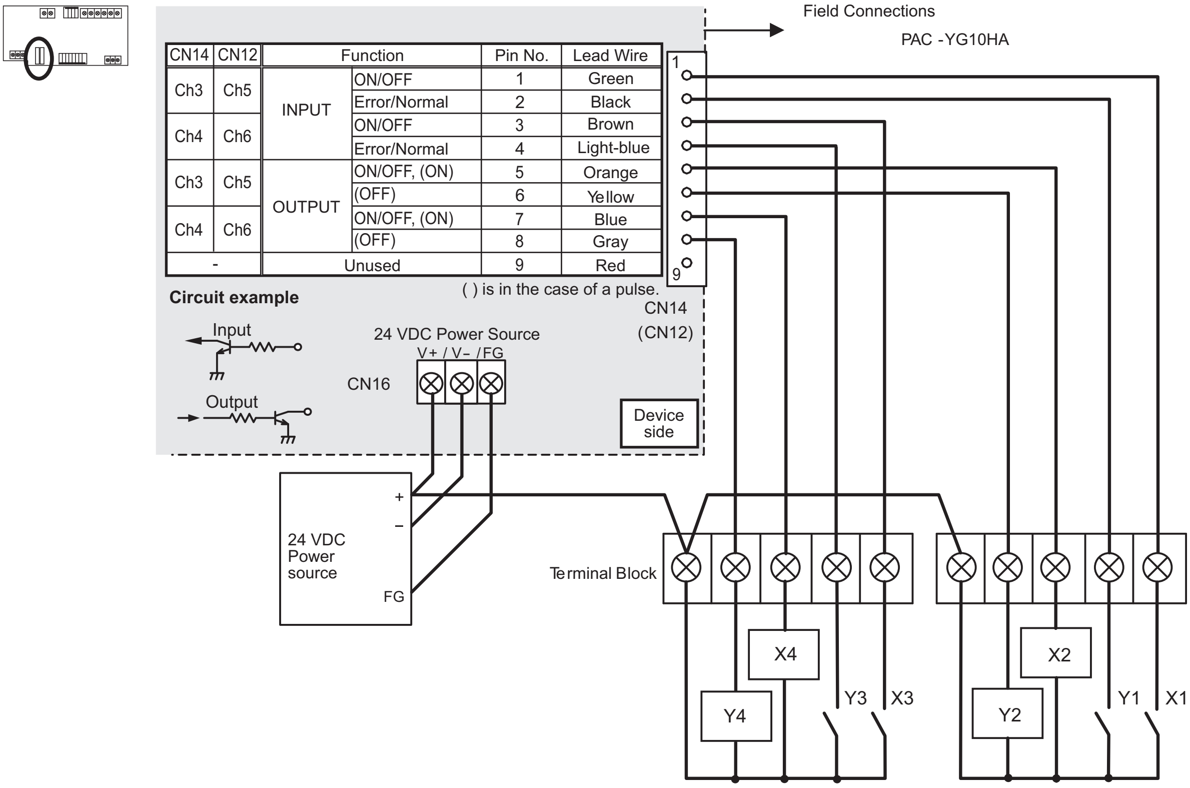
⚠**CAUTION**	• When X1, X2, Y1 and Y2 relays are used, select ones that satisfy the following specifications. Operating coil Rated voltage: 24 VDC (Built-in diode) Power consumption: 0.9 W or less (*1) Be sure to use the ones with the voltages rated above. Exceeding the rated voltage may affect the ON/OFF of other outputs. (*2) When using a separate power supply for this device, connect GND of the power supply to V- of CN16 of the terminal block of this device. (*3) Use a relay with a withstanding voltage of at least 2000 VAC between the coil and contact. Otherwise, there is the likelihood of an electric shock or fire. • Strip 12±1 mm (15/32±1/32 in) of the wire coating and insert firmly into the terminal. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. • Perform wiring so that the terminal block is not strained. If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block. • Do not connect the wires directly from the top of the control panel to the terminal block. Moisture may enter this device along the wiring and cause electric shock or fire.

CONTROLLER

2) Expansion Connectors (Channels 3 to 6)

(2-1) Expansion Inputs/Outputs

Purchase an optional external input/output adapter (model: PAC-YG10HA-E) when using expansion inputs/outputs.
PAC-YG66DCA has two expansion connectors, and up to two external input/output devices can be connected to each connector.
An optional external input/output adapter is required for each connector used.



CN14	CN12	Function		Pin No.	Lead Wire
Ch3	Ch5	INPUT	ON/OFF	1	Green
			Error/Normal	2	Black
Ch4	Ch6		ON/OFF	3	Brown
			Error/Normal	4	Light-blue
Ch3	Ch5	OUTPUT	ON/OFF, (ON)	5	Orange
			(OFF)	6	Yellow
Ch4	Ch6		ON/OFF, (ON)	7	Blue
			(OFF)	8	Gray
-		Unused		9	Red

( ) is in the case of a pulse.

[Input]
Contacts closed (24 VDC applied): Operating (ON); detected an error
Contacts open : Stopped (OFF); detected as normal
* Error/normal detection becomes inverted from contact open/closed logic for a b-contact setting.
[Output]
Operate (ON) output : Transistor ON (sink)
Stop (OFF) output : Transistor OFF(open)
* Upon pulse output, the (ON), (OFF) transistors turn ON (sink) according to the output content. ((ON) and (OFF) refer to the junctions in the diagram.)

⚠CAUTION

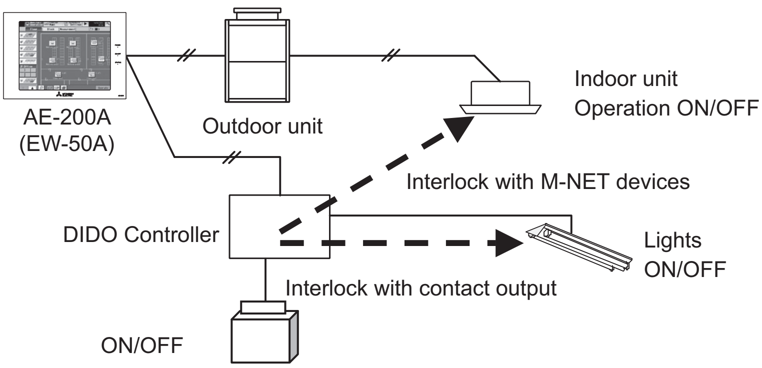
- When using X1, X2, X3, X4, Y1, Y2, Y3 and Y4 relays, select ones that satisfy the following specifications.
  Operating coil Rated voltage: 24 VDC (Built-in diode)
  Power consumption: 0.9 W or less
  (*1) Be sure to use the ones with the voltages rated above. Exceeding the rated voltage may affect the ON/OFF of other outputs.
  (*2) When using a separate power supply for this device, connect GND of the power supply to V– of CN16 of the terminal block of this device.
  (*3) Use a relay with a withstanding voltage of at least 2000 VAC between the coil and contact. Otherwise, there is the likelihood of an electric shock or fire.
- Select a contact with a minimum applicable load of 1 mADC or less for the input contact.
- Do not install alongside or in contact with other wires.

3. Interlock control

The DIDO controller (PAC-YG66DCA) has an interlock control function, which enables operation or set temperature change on the M-NET devices such as indoor units and also enables signal output to the contacts on the DIDO controller.
Interlock control covers the units connected to the DIDO controller with M-NET system.
AE-200A/AE-50A/AG-150A-A/EW-50A/EB-50GU-A must be connected to use the function.
Ask your dealer for interlock control setting. The setting requires special tool support.

⚠CAUTION	Before using the interlock control, you must agree to the following. 1.This feature must not be used for disaster prevention or security purpose. (Not designed to be used in situations that are life-threatening) 2.No functions must be added that allow the malfunctioning unit to run by defeating the safety features, such as an external ON/OFF switch or a short-circuit. 3.Those settings for the function that are not supported by the interlocked units must not be made. All the settings must be made within the specified range. (Failure to observe these precautions may result in malfunctions and failures.) 4.Perform a test run for interlock control, and confirm the correct settings and normal operation. 5.The system must be configured in the way that integrates the operation of the interlocked fire and emergency control systems.

Item	Content	Remarks
Number of events	24 events	1 event interlock with 1 unit
Determinant condition for interlock control	At input contact change	• Operation input ON/OFF • Error input Error/Normal
Interlock control contents (to be output)	1 action for 1 condition • ON/OFF operation of indoor units • Operation mode change of indoor units • Temperature setting of indoor units (*1) • Contact output to DIDO controller (*2)	Interlock control covers the units connected to DIDO controllers with M-NET system. (*1) Temperature setting range: 19-28ºC (Standard setting) (*2) DIDO controller itself or other DIDO controllers in the same M-NET system.
Other	Interlock control prohibition function is enabled at emergency stop from AE-200A/ AE-50A/AG-150A-A/EW-50A/EB-50GU-A	



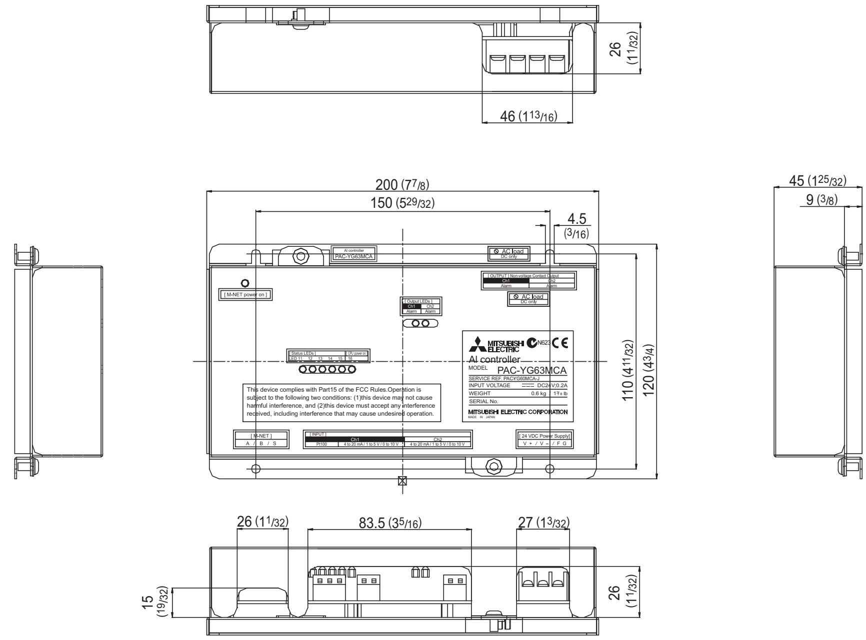
Interlock control of DIDO controller (example)

Note: Do not use Interlock control function on both AE-200A/AE-50A/AG-150A-A/EW-50A/EB-50GU-A and DIDO controller at the same time.

3-12. AI controller [PAC-YG63MCA]

The AI controller measures temperature and humidity; it also has an alarm capability if the measurement data exceeds defined setpoints.
Historical measurement data can be displayed via only the AE-200A/AE-50A/AG-150A-A/EW-50A/EB-50GU-A and TG-2000A.
Temperature and humidity can be displayed on the AG-150A-A LCD.
Furthermore, an alarm can be output if measurement data exceeds a preset upper or lower limit.
The AI controller also features a function that interlocks M-NET devices for indoor units, etc.

■External Dimensions



Unit: mm (in)

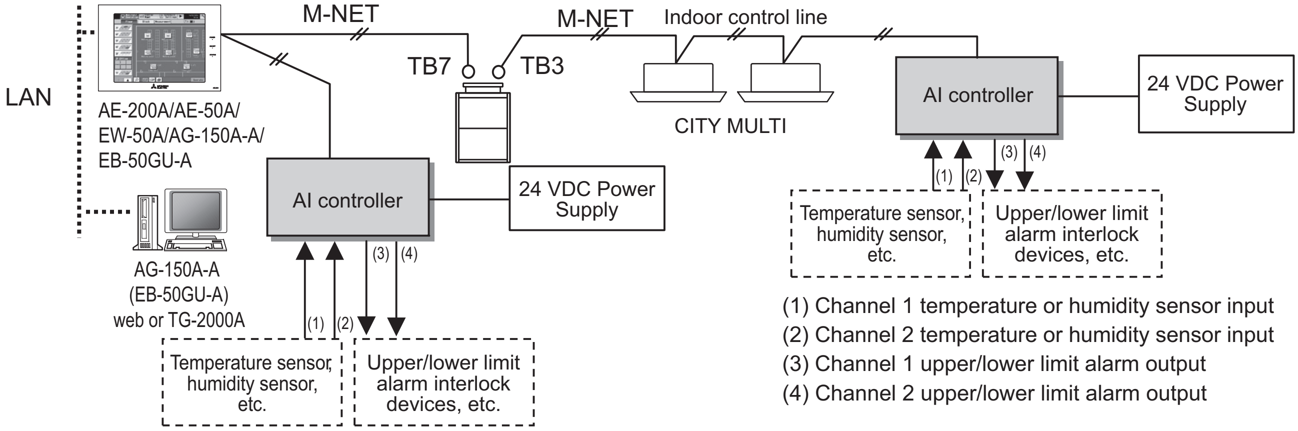
⚠CAUTION	Usage Restrictions • Mitsubishi Electric does not take financial responsibility for damages caused by issues beyond our control or special circumstances (predicable or unpredictable); and secondary or accidental damages, and damages to other objects. We also do not take financial responsibility for opportunities lost as a result of device failure, or electrical power failure at the end-user site. Mitsubishi Electric does not take financial responsibility caused by end-users' requests including, but not limited to, device testing, startup, readjustment and replacement. • Do not use this device in disaster prevention security or "critical to life" applications.

1. Specifications

(1). Device Specifications

Item	Description						
Power Supply	24 VDC ±10%: 5 W						Screw terminal block (M3) (*5)
Interface	M-NET communication			17 to 30 VDC (*1)			Screw terminal block (M3) (*5)
	Input (*2)	Ch	Sensor	Measurement target	Measurement range	Measurement error	External connection method
	Input (*2)	Ch1	Pt100 (3-wire system)	Temperature	-30 to 60°C [-22 to 140°F]	±0.3%FS ±0.1°C (0.18°F) (*3) [at 25°C (77°F)]	Screwless terminal block (3 poles)
	Input (*2)	Ch1	Analog: 4 to 20 mADC / 1 to 5 VDC / 0 to 10 VDC	Temperature/ humidity	(Set by system controller)	±0.5%FS ±0.1°C (0.18°F) (*3) ±0.5%FS ±0.1%RH [at 25°C (77°F)]	Screwless terminal block (2 poles)
	Input (*2)	Ch2	Analog: 4 to 20 mADC / 1 to 5 VDC / 0 to 10 VDC	Temperature/ humidity	(Set by system controller)	±0.5%FS ±0.1°C (0.18°F) (*3) ±0.5%FS ±0.1%RH [at 25°C (77°F)]	Screwless terminal block (2 poles)
	Output	Upper/lower limit alarm interlock output (non-voltage contact)		Applied load MAX: 24 VDC, 5 W MIN: 5 VDC, 2 mW * AC loads cannot be connected.			Screw terminal block (M3.5) (*5)
Interlock Function	Interlock M-NET devices according to measurement data values. (*4)						
Environment Conditions	Temperature			Operating temperature range	0 to 40°C [32°F to 104°F]		
	Temperature			Storage temperature range	-20 to 60°C [-4°F to 140°F]		
	Humidity			30 to 90%RH (no condensation)			
Dimensions	200 (W) × 120 (H) × 45 (D) mm / 7 7/8 (W) × 4 3/4 (H) × 1 25/32 (D) in						
Weight	0.6 kg / 1 3/8 lb						
Time Backup During Power Failure	In the event of power failure or shut-off, the internal capacitor will continue to track time for approximately one week. (The internal capacitor takes about 24 hours to fully charge; a replacement battery is not necessary.)						
Installation Environment	Inside the metal control board (indoors) * Use this product in a hotel, a business office environment or similar environment.						

*1: Supply electric power from a power supply unit for the transmission line or an outdoor unit. Furthermore, the power consumption factor of the MNET circuitry of this unit is "1/4".
*2: Configure the dip switch settings for the analog input method to use.
*3: The measurement error for the system includes the measurement error for this unit, sensor, and wiring.
a%FS (full scale) = a% × ([measurement range's upper limit value] - [lower limit value])
*4: Settings for the interlock function are performed from the Maintenance Tool. For details, refer to the operation manual for the Maintenance Tool.
*5: M3 and M3.5 are sizes of the screw on the terminal block (ISO metric screw thread). The number indicates the screw diameter (mm).



*This figure omits the power supply line and only shows the transmission line.

<Restrictions>
Maximum of 50 units per AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A
However, the number of units that can be connected to a AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A is up to 50 including this device, an indoor unit, Lossnay unit, etc.

NOTE	• For the shield ground of the M-NET centralized control line, use single-point grounding at the power unit for the transmission line. However, when supplying electric power to the M-NET centralized control line from the R410A-Series outdoor unit*1 without using a power supply unit for the transmission line, use single-point grounding at the TB7 of that outdoor unit. *1: Except PUMY model and PUHY/PURY-T(S)LMU/T(S)KMU model (Y/R2/H2i R2-Series) Furthermore, when connecting the M-NET transmission line of this device to the M-NET indoor control line, use grounding at the TB3 for each outdoor unit system. • If the M-NET transmission line of this device is connected to an M-NET indoor control line and the outdoor unit is down because, for example, the power supply is interrupted for servicing or there is a failure, the AI controller can not be set and monitored from the system controller. • The sensor connected to the AI controller can only be monitored from AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A and TG-2000A. The sensor can be monitored from the AG-150A-A LCD.

(2). Parts Purchased Separately

Prepare the following parts to install this device.

Required Part	Specification
Unit fixing screws	M4 screw × 4 (* M4: ISO metric screw thread)
Power supply for this device	Commercially available power source: 24 VDC ±10% 0.2 A (Minimum loading), SELV circuit, power line with grounding terminal Ripple noise: Lower than 200 mVp-p Compatible specification Authorized or CE marked products. Subject to regulations: - IEC60950 (or EN60950) - CISPR22/24 (or EN55022/24) - IEC61000-3-2/3-3 (or EN61000-3-2/3-3)
Power supply for sensors	A separate power supply for sensors may be required. In the case of 24 VDC voltage, the capacity of the power supply for this unit can be increased so that the power supply can be shared.
Power line	Use a sheathed vinyl cord or cable. At least 0.75 mm^2 (AWG18)
M-NET transmission line	Type of the cable: Sheathed vinyl cords or cable which comply with the following specifications or equivalent. • CPEV ø1.2 mm to ø1.6 mm • CVVS 1.25 mm^2 to 2 mm^2 (AWG 16 to 14) * CPEV: PE insulated PVC sheathed shielded communication cable * CVVS: PVC insulated PVC sheathed shielded control cable PE: Polyethylene PVC: Polyvinyl chloride Power needs to be supplied to the M-NET circuitry of this device. Use an outdoor unit or a separately purchased power supply unit for the transmission line.
Signal lines (Sensor input lines)	Shows the size of the electric wire (copper wire) that is adapted to the terminal block of this device. Refer to the usage and cautionary items of the sensor when performing settings. However, use a line with shielded line. Electric wire size ···· (1)Solid wire: ø 0.65 mm (AWG21) - ø 1.2 mm (AWG16) (2)Stranded wire: 0.75 mm^2 (AWG18) - 1.25 mm^2 (AWG16) Single strand: At least ø 0.18 mm

[Parts to be Purchased Separately]

Name	Model	Application	Remark
Power supply unit	PAC-SC51KUA	Power supply to the M-NET transmission line	This is not required when power is to be supplied from an outdoor unit.

[Commercially available parts]

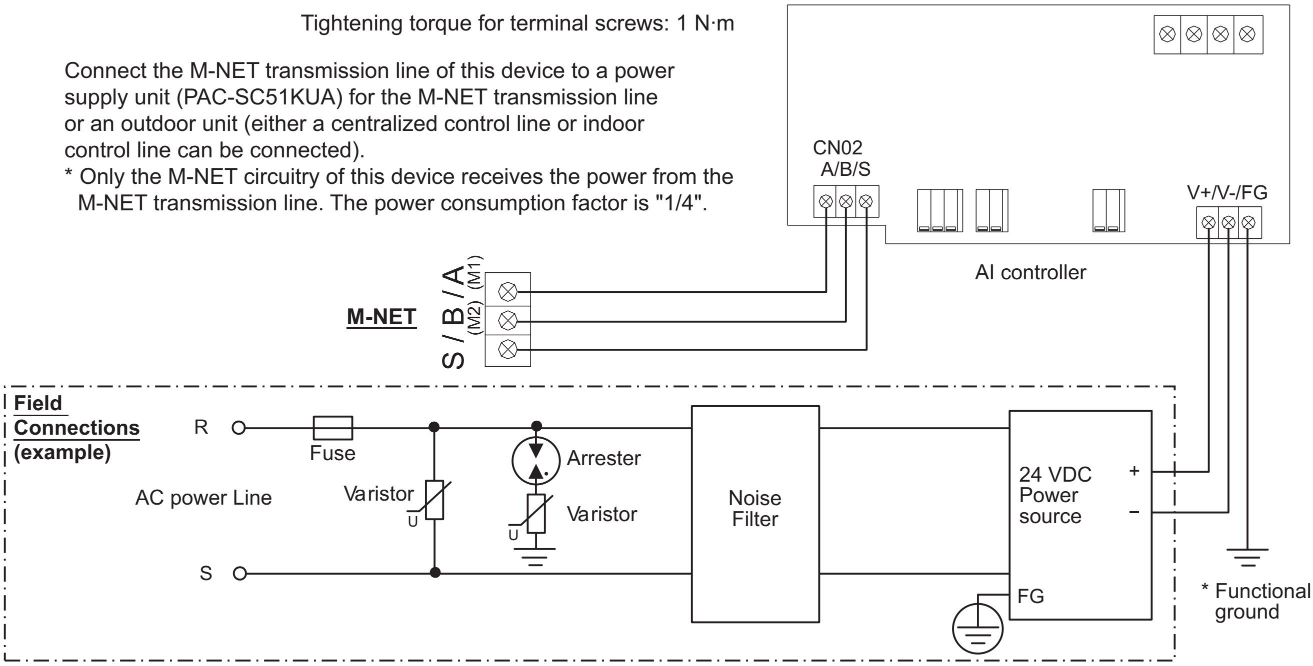
Part	Use	Remark
External 24 VDC power source	Supplies power to the AI controller.	Refer to "Power supply for this device" and "Power supply for sensors" in "Required Part" above for the capacity of the power supply.
Sensor	Measures temperature and humidity.	Temperature sensor (PAC-SE40TSA) cannot be connected.

2. Wiring Instructions

(1). Connecting the Power and M-NET Transmission Lines

Tightening torque for terminal screws: 1 N·m

Connect the M-NET transmission line of this device to a power supply unit (PAC-SC51KUA) for the M-NET transmission line or an outdoor unit (either a centralized control line or indoor control line can be connected).
* Only the M-NET circuitry of this device receives the power from the M-NET transmission line. The power consumption factor is "1/4".



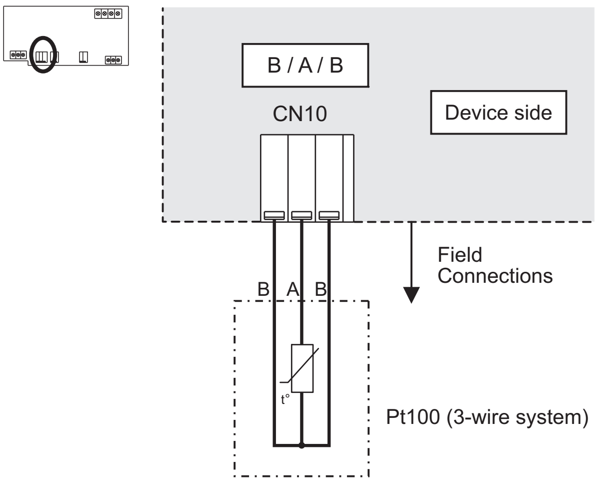
⚠CAUTION	• Use a power line and M-NET transmission line that satisfy the specifications described in "1-(2). Parts Purchased Separately". • Attach a circuit comprising the following components to the supply primary side of the 24 VDC power supply. (1) Varistor, (2) Arrester, (3) Noise filter, (4) Fuse • It is important to pay attention to the polarity when connecting to the 24 VDC power supply terminal block. Connecting the positive and negative in the reverse order will cause a failure. • Fix the power line and M-NET transmission line in place on the outside to ensure that the terminal block is not affected by any external force. Not securely connecting and fixing the wires in place may cause heat generation and fire. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. Cover the shielded line of the M-NET transmission line with materials such as vinyl tape and prevent short-circuiting with the plates.

NOTE	• If the M-NET transmission line of this device is connected to an M-NET indoor control line and the outdoor unit is down because, for example, the power supply is interrupted for servicing or there is a failure, the AI controller cannot be set and monitored from the system controller. • Be sure to ground this device, PAC-SC51KUA and 24 VDC Power source. Measurement accuracy may be affected if devices are not grounded.

(2). Connecting the Sensors

- For channel 1, select one of the following four types: Pt100 detection, 4 to 20 mADC, 1 to 5 VDC, or 0 to 10 VDC analog input.
- For channel 2, select one of the following three types: 4 to 20 mADC, 1 to 5 VDC, or 0 to 10 VDC analog input.
- The wire length depends on the specifications of the sensor. However, since the use of long wires makes the device susceptible to noise, using wires shorter than 12 m (39.4 ft) is recommended. Use a shielded line for the sensor line and connect to the FG terminal on this unit or the FG terminal on the control panel.

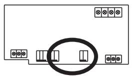
1) Channel 1 Pt100 Input



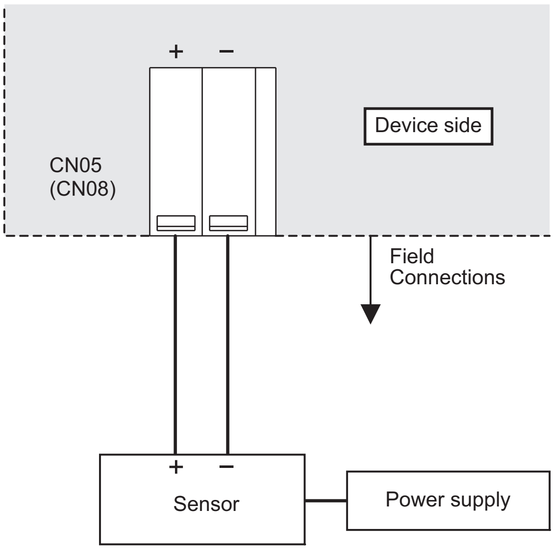
⚠ **CAUTION**

- Use a 3-wire system for Pt100.
- A/B polarity is important for Pt100.
  Be sure to match the polarity when using Pt100.
- Do not install the sensor input line parallel to or near the M-NET transmission line or power line.
  Also avoid loop wiring.
  Furthermore, confirm the precautions for the sensor.
- Strip 12 ± 1 mm (15/32 ± 1/32 in) of the wire coating and insert firmly into the terminal.
- Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires.
- Perform wiring so that the terminal block is not strained.
  If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block.

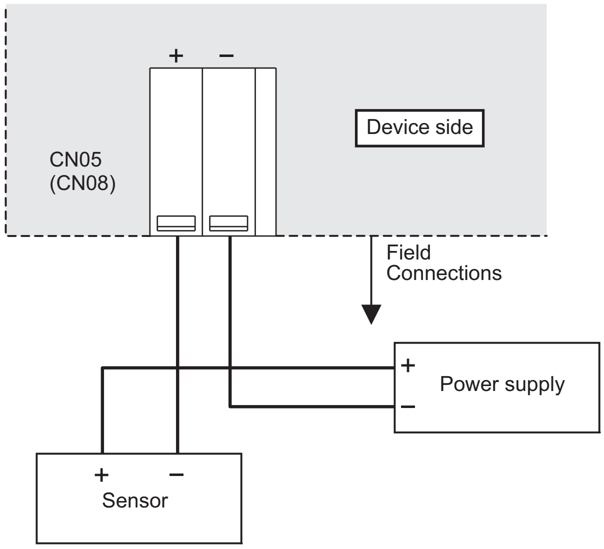
2) Channel 1 (Channel 2) Analog Input (4 to 20 mADC, 1 to 5 VDC, 0 to 10 VDC)



(a) When 1 to 5 VDC, 0 to 10 VDC, or 4 to 20 mADC
(type for which power is supplied to the sensor)
is connected



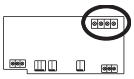
(b) When 4 to 20 mADC
(type for which power is supplied to the signal line)
is connected

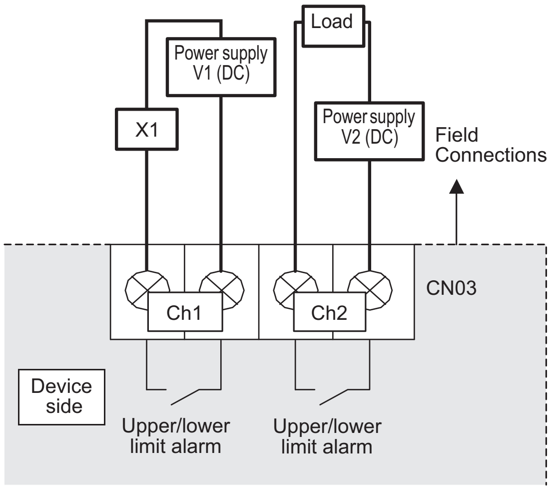


⚠CAUTION	• Select a power supply that is suitable for the sensor to be used. • Do not install the sensor input line parallel to or near the M-NET transmission line or power line. Also avoid loop wiring. Furthermore, confirm the precautions for the sensor. • Strip 12±1 mm (15/32 ±1/32 in) of the wire coating and insert firmly into the terminal. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. • Perform wiring so that the terminal block is not strained. If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block.

(3). Connecting Alarm Setpoint Outputs (Non-valtage Contacts)

The maximum wire length is 100 m. However, since the use of long wires makes the device susceptible to noise, using wires no more than 10 m long is recommended.





* The contact of the internal relay is always ON during detection of an upper/lower limit alarm. (Level output)

Tightening torque for terminal screws: 1 N·m.

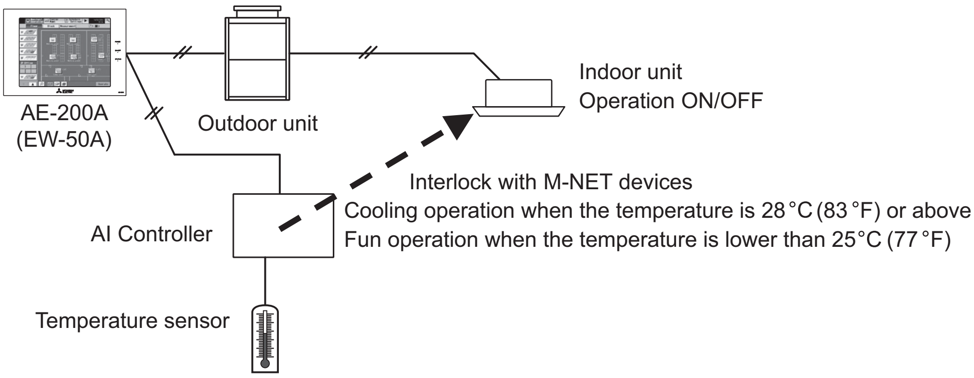
⚠CAUTION	• To use X1 relay, obtain one that satisfies the following specifications. Operating coil [Applied load] MAX: 24 VDC, 5 W (Built-in diode) MIN: 5 VDC, 2 mW (Built-in diode) *1 AC loads cannot be connected. *2 Provide a power supply (V1, V2) that matches the load and relay to be used. • To drive a direct load, use ones within the following. [Applied load] MAX: 24 VDC, 5 W MIN: 5 VDC, 2 mW * AC loads cannot be connected. • Make sure that the copper wiring is not short-circuiting the plates (cover, lower case) or neighboring wires. • Perform wiring so that the terminal block is not strained. If strained, use a wire guide or junction terminal to alleviate the stress on the terminal block. • Do not connect the wires directly from the top of the control panel to the terminal block. Moisture may enter this device along the wiring and cause electric shock or fire.

3. Interlock control

AI controller (PAC-YG63MCA) has an interlock control function, which enables operation or set temperature change on the M-NET devices such as indoor units.
Interlock control covers the units connected to the AI controller with M-NET system. AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A must be connected to use the function.
Ask your dealer for interlock control setting. The setting requires special tool support.

⚠CAUTION	Before using the interlock control, you must agree to the following. 1.This feature must not be used for disaster prevention or security purpose. (Not designed to be used in situations that are life-threatening) 2.No functions must be added that allow the malfunctioning unit to run by defeating the safety features, such as an external ON/OFF switch or a short-circuit. 3.Those settings for the function that are not supported by the interlocked units must not be made. All the settings must be made within the specified range. (Failure to observe these precautions may result in malfunctions and failures.) 4.Perform a test run for interlock control, and confirm the correct settings and normal operation. 5.The system must be configured in the way that integrates the operation of the interlocked fire and emergency control systems.

Item	Content	Remarks
Number of events	24 events	1 event interlock with 1 unit
Determinant condition for interlock control	Measurement value Measurement interval is 1 to 7200 seconds.	• Exceeding measurement value in setting range • Exceeding upper/lower limit alarm detection value and cancellation value
Interlock control contents (to be output)	1 action for 1 condition • ON/OFF operation of indoor units • Operation mode change of indoor units • Temperature setting of indoor units (*1) • Contact output to DIDO controller	Interlock control covers the units connected to AI controllers with M-NET system. (*1) Temperature setting range: 19-28ºC (Standard setting)
Other	Interlock control prohibition function is enabled at emergency stop from AE-200A/ AE-50A/EW-50A/AG-150A-A/EB-50GU-A	



Interlock control of AI controller (example)

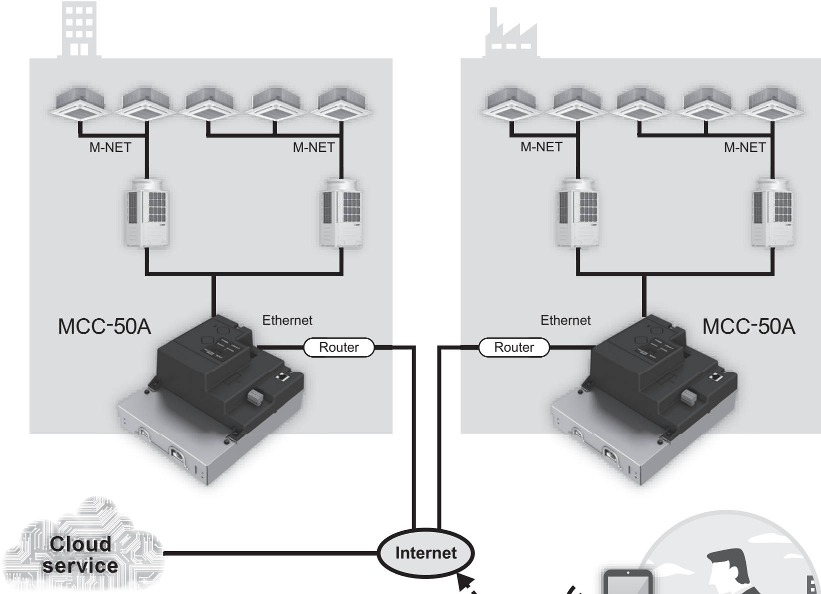
3-13. Cloud system connection device [MCC-50A]

Dual Set Point

MCC-50A

*An Internet connection is required.
Depending on the network environment, communication costs may be incurred.
Ensure sufficient network security.
*This device is not suitable for use in locations where children are likely to be present.
*Up to 50 CITY MULTI indoor units can be connected to each MCC-50A.

■ System example



Cloud service

*The cloud service start date is to be determined. Consult your distributor for detail.

■ Product specifications

Item			Specifications
Power supply			100–240 VAC ± 10%; 50/60 Hz Single-phase
M-NET power feeding coefficient			1.5
Network interface			100BASE-TX
Ambient conditions	Temperature	Operating temperature range	+14°F – +131°F (-10°C – +55°C)
		Storage temperature range	-4°F – +140°F (-20°C – +60°C)
	Humidity		30%–90% RH (Non-condensing)
Dimensions (W × H × D)			6-13/16 × 8-4/16 × 3-15/16 in (172 × 209 × 100 mm) * 6-13/16 × 10 × 3-15/16 in (172 × 253 × 100 mm) when using L-fittings
Weight			3-3/4 lbs (1.7 kg)

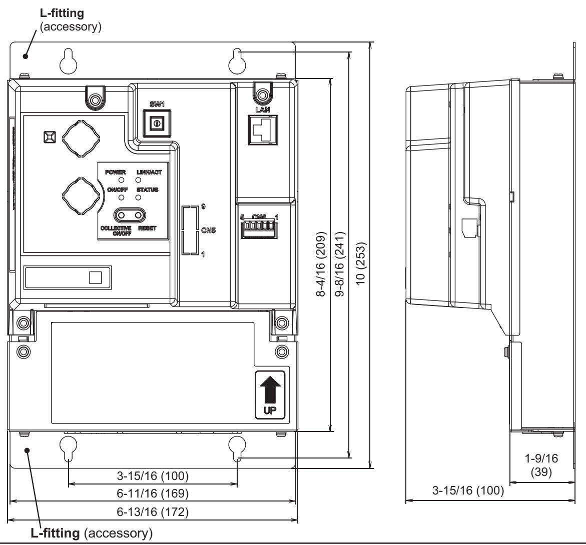
■ Connectable units

CITY MULTI

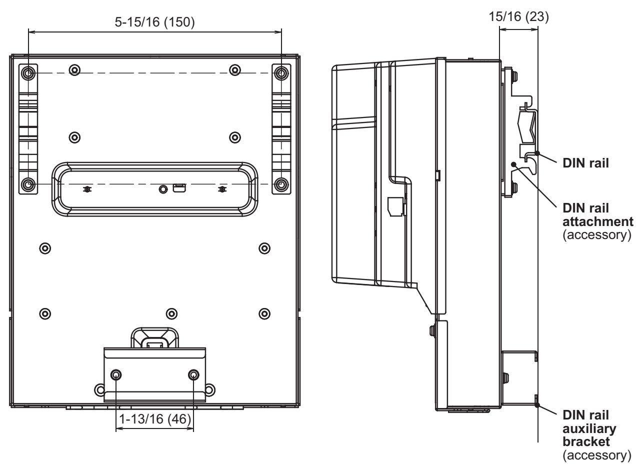
*Certain other products that are connectable to the M-NET may be connectable to the Cloud system connection device. Consult your nearest distributor for detail.

■ External dimensions

• When using L-fittings Unit: in (mm)



• When using DIN rail Unit: in (mm)



CONTROLLER

4-1. S/Y/H2i Y/R2/H2i R2-Series

CITY MULTI system can be monitored or controlled with signal to/from the outside as every control board of Indoor unit or Outdoor unit has input/output signal connectors. Independent control to the individual Indoor or Outdoor can be carried out by using these connectors. Yet, for large-scale control, MELANS would be much easier.
When using input/output connectors, a dedicated adapter (optional part) and a relay circuit needed to be prepared by the site. Following are some typical example.

Table 4-1-1. Control can be achieved by using Outdoor input/output connectors.

Function	Usage	Using connector		Signal	Option
		PUHY	PURY		
Demand	Prohibiting cooling/heating operation (thermo OFF) by an external input to the outdoor unit. * It can be used as the demand control for each refrigerant system.	CN3D	CN3D	Input (level-signal)	Adapter for external input (PAC-SC36NA-E)
Low noise mode	Performs a low noise operation of the outdoor unit by an external input to the outdoor unit. * It can be used as the low noise operation device for each refrigerant system.				
Snow sensor signal input	Forces the outdoor unit to perform a fan operation by receiving signals from the snow sensor. *4	CN3S	CN3S		
Auto-changeover	Cooling/heating operation can be changed by an external input to the outdoor unit.	CN3N	-		
Energy-saving mode	The operation mode of the unit can be changed from normal cooling operation (performance priority) to energy-saving cooling mode by an external signal input.	CN3K	CN3K		
Operation status of the compressor	How to extract signals from the outdoor unit. * It can be used as an operation status display device. * It can be used for an interlock operation with external devices.	CN51	CN51	Output (level-signal)	Adapter for external output (PAC-SC37SA-E)
Error status					

*1 For details, refer to 1) through 4) shown below.
*2 Low noise mode is valid when Dip SW6-8 on the outdoor unit is set to OFF. When DIP SW6-8 is set to ON, 4 levels of on-DEMAND are possible, using different configurations of low noise mode input and DEMAND input settings.
When 2 or more outdoor units exist in one refrigerant circuit system, 8 levels of on-DEMAND are possible. When 3 outdoor units exist in one refrigerant circuit system, 12 levels of on-DEMAND are possible.
*3 Low noise mode can be switched from ability main to low noise main with Dip SW6-7 on the outdoor unit. Dip SW6-7 OFF: ability main (ability main mode : The sound pressure level is reduced by limiting the maximum fan frequency under the following condition. Cooling mode : outdoor temp. (TH7) ≤ 30°C Heating mode : outdoor temp. (TH7) ≥ 3°C), ON: low noise main.
*4 When multiple outdoor units exist in one refrigerant circuit system, settings on every outdoor unit (signal input) are required.
*5 For detailed drawing, refer to "4-2. Outdoor unit input/output connector".

1) Table 4-1-2. SW6-8: OFF (Compressor ON/OFF, Low noise mode)

CN3D 1-3P	2-level of on-Demand *6
Open	100%(No Demand)
Short-circuit	0%

CN3D 1-2P	Low noise mode *7 *8
Open	OFF
Short-circuit	ON

*6 When SW6-8 on the outdoor unit in one refrigerant circuit system is set to ON (4 levels or 8 levels or 12 levels of on- DEMAND), this function cannot be used.
*7 This function and the 4 levels or 8 levels on-DEMAND function can be used together. Input the order to CN3D 1-2P on the outdoor unit whose SW6-8 is set to OFF.
*8 The following four patterns shown in the low noise mode setting table can be set.

Low noise mode setting table

	SW4		
	997	1006	
50%	OFF	OFF	Factory setting
60%	OFF	ON	
70%	ON	ON	
85%	ON	OFF	

2) When SW6-8 on one outdoor unit in one refrigerant circuit system is set to ON (4 levels of on-DEMAND) (*9)

	CN3D 1-2P	
CN3D 1-3P	Open	Short-circuit
Open	100% (No DEMAND)	75%
Short-circuit	0%	50%

Note the following steps to be taken when using STEP DEMAND.
Example: When switching from 100% to 50%

Steps in DEMAND level setting	<WRONG>	100%	→	NO 0%	→	50%
	<CORRECT>	100%	→	OK 75%	→	50%

If the demand settings are switched in the wrong order listed as the wrong example above, the unit may go into thermo OFF mode.
The percentage of the DEMAND listed in the table above is an approximate value based on the compressor volume and does not necessarily correspond with the capacity.
This function and the Low noise mode function cannot be used together.

3) When SW6-8 on the two outdoor units in one refrigerant circuit system is set to ON (8 levels of on-DEMAND) (*9,*10)

8 levels of on-DEMAND		No.2 CN3D				
		1-2P	Open		Short-circuit	
No.1 CN3D	1-2P	1-3P	Open	Short-circuit	Open	Short-circuit
	Open	Open	100% (No DEMAND)	50%	88%	75%
		Short-circuit	50%	0%	38%	25%
	Short-circuit	Open	88%	38%	75%	63%
		Short-circuit	75%	25%	63%	50%

4) When SW6-8 on the all outdoor units in one refrigerant circuit system is set to ON (12 levels of on-DEMAND) (*10)

12 levels of on-DEMAND	No.2 CN3D	1-2P	Open							
		1-3P	Open				Short-circuit			
	No.3 CN3D	1-2P	Open		Short-circuit		Open		Short-circuit	
No.1 CN3D	1-2P	1-3P	Open	Short-circuit	Open	Short-circuit	Open	Short-circuit	Open	Short-circuit
	Open	Open	100%	67%	92%	84%	67%	34%	59%	50%
		Short-circuit	67%	34%	59%	50%	34%	0%	25%	17%
	Short-circuit	Open	92%	59%	84%	75%	59%	25%	50%	42%
		Short-circuit	84%	50%	75%	67%	50%	17%	42%	34%

12 levels of on-DEMAND	No.2 CN3D	1-2P	Short-circuit							
		1-3P	Open				Short-circuit			
	No.3 CN3D	1-2P	Open		Short-circuit		Open		Short-circuit	
No.1 CN3D	1-2P	1-3P	Open	Short-circuit	Open	Short-circuit	Open	Short-circuit	Open	Short-circuit
	Open	Open	92%	59%	84%	75%	84%	50%	75%	67%
		Short-circuit	59%	25%	50%	42%	50%	17%	42%	34%
	Short-circuit	Open	84%	50%	75%	67%	75%	42%	67%	59%
		Short-circuit	75%	42%	67%	59%	67%	34%	59%	50%

*9 Input the order to CN3D on the outdoor unit whose SW6-8 is set to ON.
*10 CN3D of No. 1, 2, 3 can be selected arbitrary with the outdoor unit whose SW6-8 is set to ON.
*11 Y/H2i Y/R2/H2i R2-Series → SW6-7, SW6-8
S-Series → SW4-4, SW5-5

Table 4-1-3. Control can be achieved by using Indoor input/output connectors.

Function	Usage	Using connector	Signal
Remote/Local switching *1 ON/OFF *2*3	Indoor group can be controlled ON/OFF by an ON/OFF switching or contact input to the connector of the head Indoor in an Indoor group. It can be interlocked with timer, door, window, or other equipment to "Force stopping"	CN32	Input (level-signal)
ON/OFF *2*3	Indoor group can be controlled ON/OFF by an external pulse signal input to the connector of the head Indoor in an Indoor group.	CN51	Input (pulse-signal)
Demand	Indoor group can be controlled ON/OFF by an ON/OFF switching or contact input to the connector of every Indoor in an Indoor group.	CN52	Input (pulse-signal)
Monitoring ON/OFF state	Signal output from a head Indoor unit, presenting its Indoor group. It can be used for monitoring or interlock with other equipment purpose and so on.	CN51	Output
Monitoring heating state		CN52	
Monitoring cooling/drying state		CN52	
Monitoring Error state Monitoring Thermo-OFF(fan) state	Signal output from every Indoor unit, for monitoring Error or Thermo-off (fan) state. It can be used for monitoring or interlock with other equipment purpose and so on.	CN51 CN52	Output

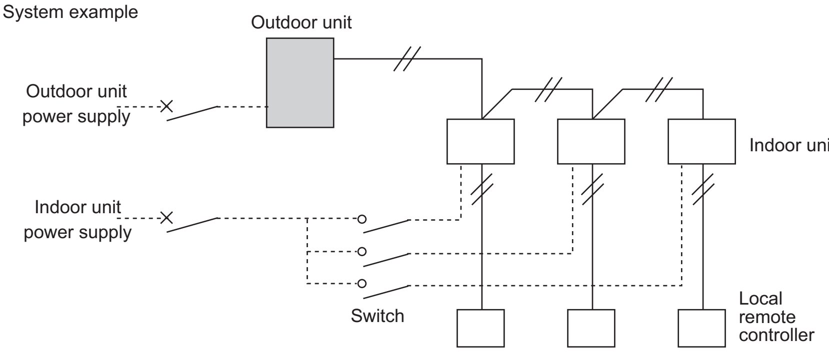
*1. When switching to Remote, control at Local remote controller will NOT be effective, but the "CENTRALLY CONTROLLED" is displayed.
*2. MA or ME remote controller is needed for this function.
*3. If using ON/OFF input function, Automatic-address-start-up can not be performed to start-up the system at commissioning.
*4. If CITY MULTI use AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A and PLC software to control external input/output signal of the Indoor unit, Dip Switch 1-9 and Dip Switch 1-10 should be set to ON.
In this case, the input/output connectors act as normal connectors, functions mentioned at Table 4-1-3. are no more available.
Details are available at the PLC software Instruction Manual.

Table 4-1-4. ON/OFF control to each Indoor unit (group) by using Dip Switch 9 and 10 (SW1-9, SW1-10) of the Indoor unit.

Function	Operation on Indoor units	Setting Dip Switch *1*4	
		1-9	1-10
Auto ON	All indoor units will turn ON and automatically resume to its previous mode after 5 minutes from power recovery.	OFF	ON
Auto recovery	Indoor unit recovers to its previous state (ON/OFF, mode) after 5 minutes from power recovery.	ON	OFF
All OFF	Forced stopping regardless of Indoor units' state.	OFF	OFF

*1. The Dip Switch setting should be carried out on every Indoor unit in the group.
*2. Outdoor unit's power supply should NOT be cut. Otherwise, power supply to case heater of the compressor would be cut too, which may cause damage to the compressor.
*3. Above method can not be applied to the power ON/OFF of the drain pump and humidifier equipment.
*4. If CITY MULTI use AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A and PLC software to control external input/output signal of the Indoor unit, Dip Switch 1-9 and Dip Switch 1-10 should be set to ON.
In this case, the input/output connectors act as normal connectors, functions mentioned at Table 4-1-4. are no more available.

■ System example



Restart of the CITY MULTI needs to be careful. When no power supply to the outdoor unit, no power supply to the compressor case heater too. The compressor needed to be warmed up before running. When using above functions, power supply to the outdoor unit should be ensured.

Table 4-1-5. How to use Remote/Local switching connector CN32

State	Local remote controller display and operation	CN32-SW-1 for Local/Remote control switching	CN32-SW-2 for Remote "ON/OFF" operation
Local remote controller control	Operation is permitted	OFF	OFF
Remote STOP	"CENTRALLY CONTROLLED" flashing, "ON/OFF" at local remote controller is not possible.	ON	OFF
Remote START	"CENTRALLY CONTROLLED" flashing, "ON/OFF" at local remote controller is not possible.	ON	ON

* For details refer to CN32 in section "4-5. Indoor unit "-E" type input/output connector".

Table 4-1-6. Limitations to combining system controls ○: Simultaneous use available ×: Simultaneous use not available

	Description		Control combining distant/local	Pulse ON/OFF	Power ON/OFF	Automatic recover
1	Control combining distant/local	CN32	-	×*1	×*1	×*1
2	Pulse ON/OFF	CN51		-	O	O
3	HA ON/OFF(JEMA)	CN51			O	O
4	Power ON/OFF	-			-	×
5	Automatic recover	-				-

*1. Pulse ON/OFF, power ON/OFF and automatic recover can only be used when the remote/local setting CN32 is set to local.
Therefore, always avoid this function when combining control.

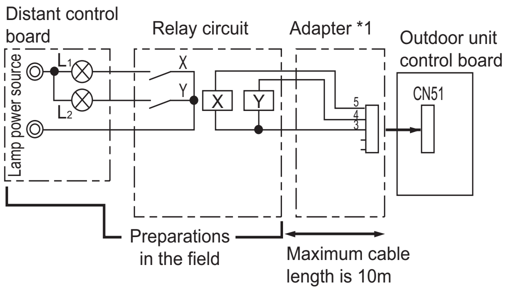
CONTROLLER

4-2. Outdoor unit input/output connector

⚠ Caution:	1.Wiring should be covered by insulation tube with supplementary insulation. 2.Use relays or switches with IEC or equivalent standard. 3.The electric strength between accessible parts and control circuit should have 2750V or more.

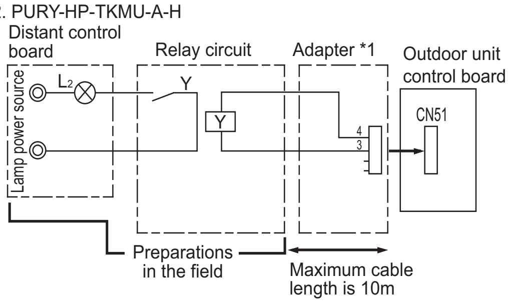
4-2-1. Output

• State (CN51) *2



L1 : Heat source unit error display lamp
L2 : Compressor operation lamp (compressor running state)
X, Y : Relay (coil =<0.9W : 12VDC)

*1. Optional part : PAC-SC37SA-E or field supply.
*2. PURY-HP-TKMU-A-H



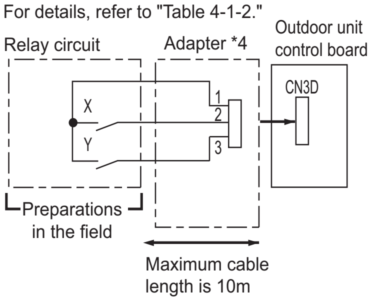
*3. On the Hyper-heating R2 HP-TKMU-A-H models, the error signal output function is disabled at default settings. Change the DipSW4 (No. 974) setting to use the error signal output function. When the setting is changed, base heaters cannot be used.

4-2-2. Input

Y/H2i Y/R2/H2i R2-Series

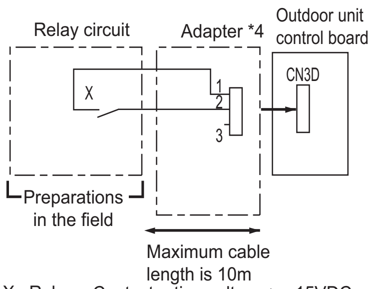
(1) Step demand and Low noise mode (CN3D)

For details, refer to "Table 4-1-2."



X : Low noise mode or demand
Y : Demand
X,Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum appicable load =< 1mA at DC
*4. Optional part : PAC-SC36NA-E or field supply.

(2) Low noise mode (CN3D + DipSW6-8 OFF)

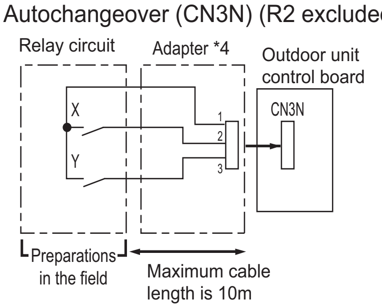


X : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC
*4. Optional part : PAC-SC36NA-E or field supply.

Low noise mode : The sound pressure level is reduced by controlling the maximum fan frequency and compressor frequency.

-Note-
The sound pressure level can not be reduced, when neither the fan frequency nor the compressor frequency are maximum.

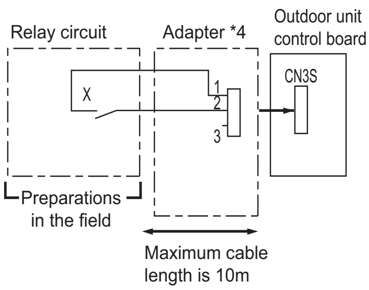
(3) Autochangeover (CN3N) (R2 excluded)



X : Cooling / Heating
Y : Validity / Invalidity of X
X,Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC
*4. Optional part : PAC-SC36NA-E or field supply.

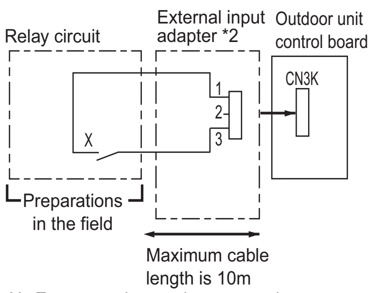
		X	
		OFF	ON
Y	OFF	Normal	
	ON	Cooling	Heating

(4) Snow sensor (CN3S)



X : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC
*4. Optional part : PAC-SC36NA-E or field supply.
Snow sensor : The outdoor fan runs when X is closed in stop mode or thermostat mode.

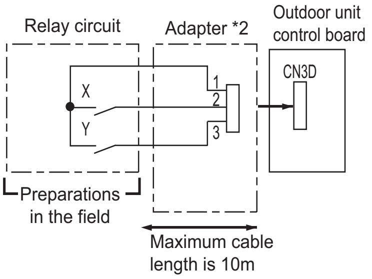
(5) Energy-saving mode (CN3K)



X : Energy-saving mode command
X : Relay Contact rating voltage >= DC15V
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC
*2. Optional part : PAC-SC36NA-E or field supply.

S-Series

(1) Step demand and Low noise mode (CN3D)



X,Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum appicable load =< 1mA at DC

*2. Optional part : PAC-SC36NA-E or field supply.

DipSW8-1 ON (Step demand only)

		X	
		OFF	ON
Y	OFF	100%	75%
	ON	0%	50%

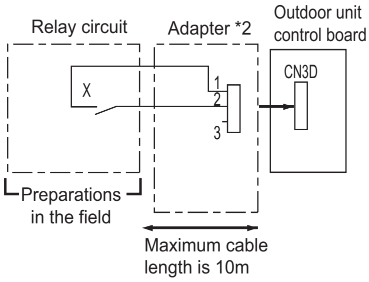
*They are rough values.

DipSW8-1 OFF (Compressor ON/OFF and Low noise mode)

Y	Compressor ON/OFF
OPEN	ON
SHORT	OFF

X	Low noise mode
OPEN	OFF
SHORT	ON

(2) Low noise mode (CN3D + DipSW8-1 OFF)



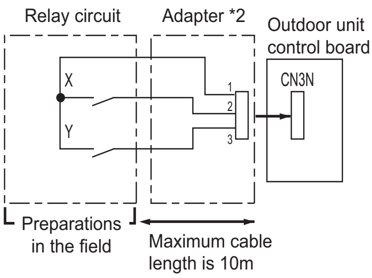
X : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC

*2. Optional part : PAC-SC36NA-E or field supply.

Low noise mode : The sound pressure level is reduced by controlling the maximum fan frequency and compressor frequency.

-Note-
The sound pressure level can not be reduced, when neither the fan frequency nor the compressor frequency are maximum.

(3) Autochangeover (CN3N)



SW1 : Cooling / Heating
SW2 : Validity / Invalidity of X
X, Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC

*2. Optional part : PAC-SC36NA-E or field supply.

		X	
		OFF	ON
Y	OFF	Normal	
	ON	Cooling	Heating

4-3. WY/WR2-Series

CITY MULTI system can be monitored or controlled with signal to/from the outside as every control board of Indoor unit or heat source unit has input/output signal connectors. Independent control to the individual Indoor or heat source can be carried out by using these connectors. Yet, for large-scale control, MELANS would be much easier. When using input/output connectors, a dedicated adapter (optional part) and a relay circuit needed to be prepared by the site.
Following are some typical example.

Table 4-3-1. Control can be achieved by using heat source input/output connectors.

Function	Usage	Using connector PQHY	Using connector PQRY	Signal	Option
Demand	Prohibiting cooling/heating operation (thermo OFF) by an external input to the heat source unit. * It can be used as the demand control for each refrigerant system.	CN3D	CN3D	Input (level-signal)	Adapter for external input (PAC-SC36NA-E)
Low noise mode	Performs a low noise operation of the heat source unit by an external input to the heat source unit. * It can be used as the low noise operation device for each refrigerant system.				
Pump Interlock signal input	Forces the heat source unit to stop operation by receiving contact signals from the pump interlock circuit	TB8	TB8		
Auto-changeover	Cooling/heating operation can be changed by an external input to the heat source unit.	CN3N	-		Adapter for external output (PAC-SC37SA-E)
Operation status of the compressor	How to extract signals from the heat source unit. * It can be used as an operation status display device. * It can be used for an interlock operation with external devices.	CN51	CN51	Output (level-signal)	
Error status					
Operation ON signal		TB8	TB8		

*1 For details, refer to 1) through 3) shown below.
*2 Low noise mode is valid when Dip SW6-8 on the heat source unit is set to OFF. When DIP SW6-8 is set to ON, 4 levels of on-DEMAND are possible, using different configurations of low noise mode input and DEMAND input settings.
When 2 or more heat source units exist in one refrigerant circuit system, 8 levels of on-DEMAND are possible.
*3 For detailed drawing, refer to "4-4. Heat source unit input/output connector".

1) Table 4-3-2. SW6-8: OFF (Compressor ON/OFF, Low noise mode)

CN3D 1-3P	2-level of on-Demand *4
Open	100%(No Demand)
Short-circuit	0%

CN3D 1-2P	Low noise mode *5
Open	OFF
Short-circuit	ON

*4 When SW6-8 on the heat source unit in one refrigerant circuit system is set to ON (4 levels or 8 levels of on- DEMAND), this function cannot be used.
*5 This function and the 4 levels or 8 levels on-DEMAND function can be used together. Input the order to CN3D 1-2P on the heat source unit whose SW6-8 is set to OFF.

2) When SW6-8 on one heat source unit in one refrigerant circuit system is set to ON (4 levels of on-DEMAND) (*6)

	CN3D 1-2P	
CN3D 1-3P	Open	Short-circuit
Open	100% (No DEMAND)	75%
Short-circuit	0%	50%

Note the following steps to be taken when using STEP DEMAND.
Example: When switching from 100% to 50%

Steps in DEMAND level setting						
	<WRONG>	100%	→	0% NO	→	50%
	<CORRECT>	100%	→	75% OK	→	50%

If the demand settings are switched in the wrong order listed as the wrong example above, the unit may go into thermo OFF mode.
The percentage of the DEMAND listed in the table above is an approximate value based on the compressor volume and does not necessarily correspond with the capacity.
This function and the Low noise mode function cannot be used together.

3) When SW6-8 on the two heat source units in one refrigerant circuit system is set to ON (8 levels of on-DEMAND) (*6,*7)

8 levels of on-DEMAND		No.2 CN3D				
		1-2P	Open		Short-circuit	
No.1 CN3D	1-2P	1-3P	Open	Short-circuit	Open	Short-circuit
	Open	Open	100% (No DEMAND)	50%	88%	75%
		Short-circuit	50%	0%	38%	25%
	Short-circuit	Open	88%	38%	75%	63%
		Short-circuit	75%	25%	63%	50%

*6 Input the order to CN3D on the heat source unit whose SW6-8 is set to ON.
*7 CN3D of No. 1, 2 can be selected arbitrary with the heat source unit whose SW6-8 is set to ON.

Table 4-3-3. Control can be achieved by using Indoor input/output connectors.

Function	Usage	Using connector	Signal
Remote/Local switching *1 ON/OFF *2*3	Indoor group can be controlled ON/OFF by an ON/OFF switching or contact input to the connector of the head Indoor in an Indoor group. It can be interlocked with timer, door, window, or other equipment to "Force stopping"	CN32	Input (level-signal)
ON/OFF *2*3	Indoor group can be controlled ON/OFF by an external pulse signal input to the connector of the head Indoor in an Indoor group.	CN51	Input (pulse-signal)
Demand	Indoor group can be controlled ON/OFF by an ON/OFF switching or contact input to the connector of every Indoor in an Indoor group.	CN52	Input (pulse-signal)
Monitoring ON/OFF state	Signal output from a head Indoor unit, presenting its Indoor group. It can be used for monitoring or interlock with other equipment purpose and so on.	CN51	Output
Monitoring heating state		CN52	
Monitoring cooling/drying state		CN52	
Monitoring Error state Monitoring Thermo-OFF(fan) state	Signal output from every Indoor unit, for monitoring Error or Thermo-off (fan) state. It can be used for monitoring or interlock with other equipment purpose and so on.	CN51 CN52	Output

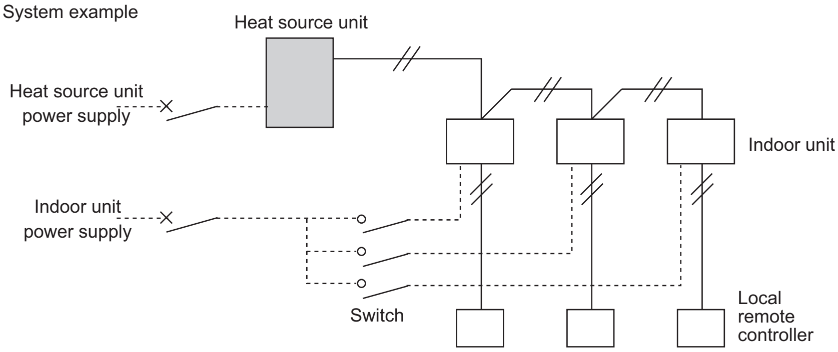
*1. When switching to Remote, control at Local remote controller will NOT be effective, but the "CENTRALLY CONTROLLED" is displayed.
*2. MA or ME remote controller is needed for this function.
*3. If using ON/OFF input function, Automatic-address-start-up can not be performed to start-up the system at commissioning.
*4. If CITY MULTI use AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A and PLC software to control external input/output signal of the Indoor unit, Dip Switch 1-9 and Dip Switch 1-10 should be set to ON.
In this case, the input/output connectors act as normal connectors, functions mentioned at Table 4-3-3. are no more available.
Details are available at the PLC software Instruction Manual.

Table 4-3-4. ON/OFF control to each Indoor unit (group) by using Dip Switch 9 and 10 (SW1-9, SW1-10) of the Indoor unit.

Function	Operation on Indoor units	Setting Dip Switch *1*4	
		1-9	1-10
Auto ON	All indoor units will turn ON and automatically resume to its previous mode after 5 minutes from power recovery.	OFF	ON
Auto recovery	Indoor unit recovers to its previous state (ON/OFF, mode) after 5 minutes from power recovery.	ON	OFF
All OFF	Forced stopping regardless of Indoor units' state.	OFF	OFF

*1. The Dip Switch setting should be carried out on every Indoor unit in the group.
*2. Heat source unit's power supply should NOT be cut. Otherwise, power supply to case heater of the compressor would be cut too, which may cause damage to the compressor.
*3. Above method can not be applied to the power ON/OFF of the drain pump and humidifier equipment.
*4. If CITY MULTI use AE-200A/AE-50A/EW-50A/AG-150A-A/EB-50GU-A and PLC software to control external input/output signal of the Indoor unit, Dip Switch 1-9 and Dip Switch 1-10 should be set to ON.
In this case, the input/output connectors act as normal connectors, functions mentioned at Table 4-3-4. are no more available.

■ System example



Restart of the CITY MULTI needs to be careful. When no power supply to the heat source unit, no power supply to the compressor case heater too. The compressor needed to be warmed up before running. When using above functions, power supply to the heat source unit should be ensured.

Table 4-3-5. How to use Remote/Local switching connector CN32

State	Local remote controller display and operation	CN32-SW-1 for Local/Remote control switching	CN32-SW-2 for Remote "ON/OFF" operation
Local remote controller control	Operation is permitted	OFF	OFF
Remote STOP	"CENTRALLY CONTROLLED" flashing, "ON/OFF" at local remote controller is not possible.	ON	OFF
Remote START	"CENTRALLY CONTROLLED" flashing, "ON/OFF" at local remote controller is not possible.	ON	ON

* For details refer to CN32 in section “4-5. Indoor unit “-E” type input/output connector”.

Table 4-3-6. Limitations to combining system controls ○: Simultaneous use available ×: Simultaneous use not available

	Description		Control combining distant/local	Pulse ON/OFF	Power ON/OFF	Automatic recover
1	Control combining distant/local	CN32	-	×*1	×*1	×*1
2	Pulse ON/OFF	CN51		-	O	O
3	HA ON/OFF(JEMA)	CN51			O	O
4	Power ON/OFF	-			-	×
5	Automatic recover	-				-

*1. Pulse ON/OFF, power ON/OFF and automatic recover can only be used when the remote/local setting CN32 is set to local.
Therefore, always avoid this function when combining control.

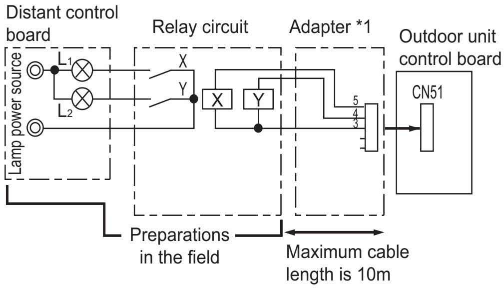
CONTROLLER

4-4. Heat source unit input/output connector

⚠ Caution:	1.Wiring should be covered by insulation tube with supplementary insulation. 2.Use relays or switches with IEC or equivalent standard. 3.The electric strength between accessible parts and control circuit should have 2750V or more.

4-4-1. Output

• State (CN51)



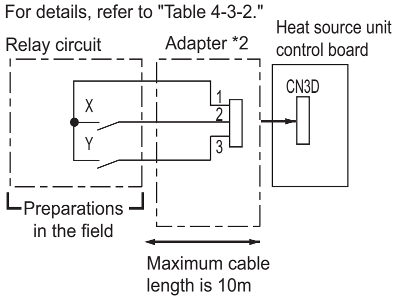
L1 : Heat source unit error display lamp
L2 : Compressor operation lamp (compressor running state)
X, Y : Relay (coil =<0.9W : 12VDC)

*1. Optional part : PAC-SC37SA-E or field supply.

4-4-2. Input

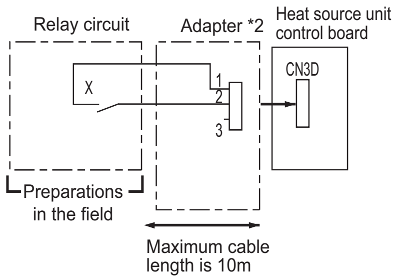
(1) Step demand and Low noise mode (CN3D)

For details, refer to "Table 4-3-2."



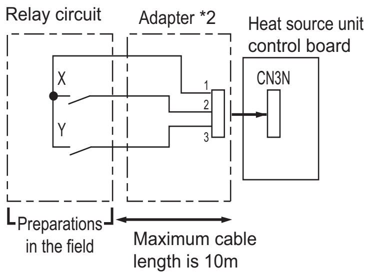
X : Low noise mode or demand
Y : Demand
X,Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum appicable load =< 1mA at DC
*2. Optional part : PAC-SC36NA-E or field supply.

(2) Low noise mode (CN3D + DipSW6-8 OFF)



X : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC
*2. Optional part : PAC-SC36NA-E or field supply.
Low noise mode : The sound pressure level is reduced by controlling the maximum fan frequency and compressor frequency.
-Note-
The sound pressure level can not be reduced, when neither the fan frequency nor the compressor frequency are maximum.

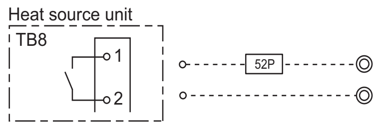
(3) Autochangeover (CN3N) (WR2 excluded)



X : Cooling / Heating
Y : Validity / Invalidity of X
X,Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC
*2. Optional part : PAC-SC36NA-E or field supply.

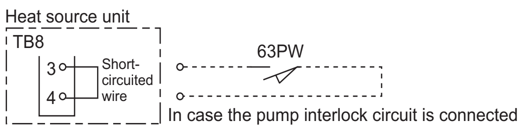
		X	
		OFF	ON
Y	OFF	Normal	
	ON	Cooling	Heating

(4) Operation ON signal (TB8)



X : Relay (Contact rating 200VAC 1A)
52P : Pump contactor

(5) Pump Interlock signal input (TB8)



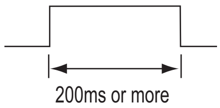
When connecting the pump interlock circuit to terminals 3 and 4 on TB8, remove the short-circuited wire.
63PW : Pressure switch (Contact: Minimum applied load 5mA)

4-5. Indoor unit "-E" type input/output connector

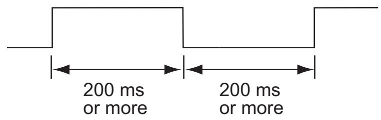
⚠ Caution:	1.Wiring should be covered by insulation tube with supplementary insulation. 2.Use relays or switches with IEC or equivalent standard. 3.The electric strength between accessible parts and control circuit should have 2750V or more.

CONTROLLER

● ON/OFF (Pulse) input specification

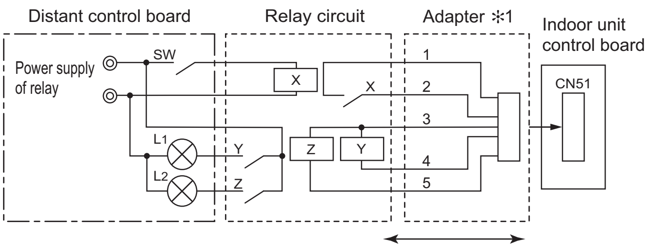
Item	Description
Input signal	Pulse sign (a connect)
Standard of pulse	

● ON/OFF (Pulse) input specification

Item	Description
Input signal	Pulse sign (Normally open)
Standard of pulse	

● Input

CN51

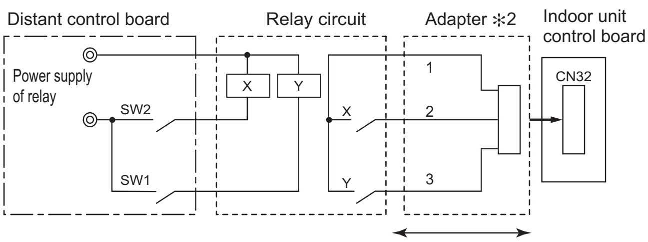


Maximum cable length is 10m[32ft.]

✻ Every time the SW is pushed (the pulse is inputted), it reacts against ON/OFF.

SW : Distant ON/OFF switch
L1 : Status lamp
L2 : Error lamp
X : Relay (a point of contact, fixed DC1mA)
Y, Z : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC

CN32

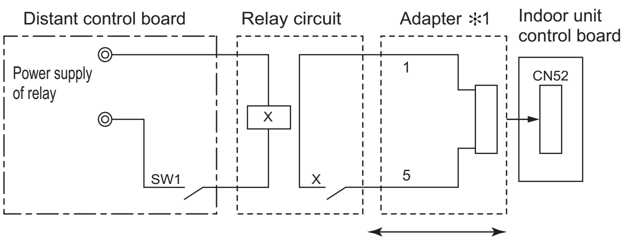


Maximum cable length is 10m[32ft.]

✻ SW2 is available when SW1 is ON.

SW1 : Distant/Local switching
SW2 : ON/OFF switch
X, Y : Relay Contact rating voltage >= 15VDC
Contact rating current >= 0.1A
Minimum applicable load =< 1mA at DC

CN52



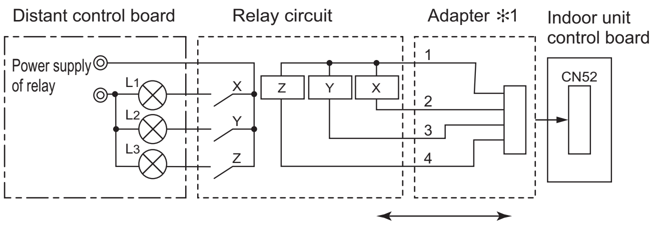
Maximum cable length is 10m[32ft.]

SW1 : Demand switch
X : Relay (coil <=0.9W,12VDC)

SW1	Indoor unit
ON	Forced thermo-OFF
OFF	Normal running

● Output

CN52



Maximum cable length is 10m[32ft.]

L1 : Status lamp
Fan motor output (SW1-5 OFF)
Thermostat ON (SW1-5 ON)
L2 : Cooling/Dry status lamp
L3 : Heating status lamp
X, Y, Z : Relay (Coil with fixed 12VDC, a power consumption of 0.9W or less)

Polarity (output terminal)

No.	Color	CN51	CN52
1	Brown		+
2	Red		-
3	Orange	+	-
4	Yellow	-	-
5	Green	-	

✻ 1. Optional part : PAC-SA88HA-E or field supply
✻ 2. Optional part : PAC-SE55RA-E or field supply

⚠Warning

- Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.
  - Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, repair, or at the time of disposal of the unit.
  - It may also be in violation of applicable laws.
  - MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.
- Our air conditioning equipment and heat pumps contain a fluorinated greenhouse gas, R410A.

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MEES21K058

New publication effective July 2021
Specifications subject to change without notice